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MOTOR AGE

MOTORING CUPS AND TROPHIES, OLD AND NEW

The Florio Cup, European Classic

OFFICIALS of the American Automobile Association have gently intimated that the famous Glidden trophy, which has been the main prize in the annual reliability test of the national organization for the last 5 years, is to be retired from competition and in its place substituted an A. A. A. national endurance run which can be run without the squabbling and fighting which has attended the events of the past. Therefore, the huge emblem which has become one of the American classics will be put on the shelf along with other cups that in the past have held the eye of the motoring public. It will rub against the James Gordon Bennett cup, which formerly was up for competition in the international road race which was run the last time in 1905. Other famous mugs there are, too, on this same shelf—the Dewar trophy, the Minneapolis cup and the other Ormond relics, not to forget some of the foreign bits of silver.

But with the withdrawal of these have come others which bid for the motoring limelight and which promise to become popular. Several of these have come in during the present year, while some of the old guard also have been up for competition. The Vanderbilt cup, an old timer, was raced for in 1909. It was won by Grant in the Alco. The Glidden went to the Pierce-Arrow, while the Algonquin cup, in the Chicago Motor Club's hill-climb, was won by Zengel in the Chadwick six. The Hollenbeck trophy was contested for the second time at Wilkes-Barre and Belcher in the Knox won a leg on it for his hill-climbing ability.

The new crop includes several valuable chunks of silver, the most costly of which is the Wheeler & Schebler trophy, which is the chief prize of the Indianapolis speedway. It was put up in a 300-mile race at the opening meet on the speedway, but no one got it, for the race was stopped by the referee after several accidents had occurred. The Wheeler & Schebler cup is valued at $10,000 and it is said there is $5,000 in coin silver alone in its makeup. The Guggenheim also made its debut this year, a massive hunk of silver which is beautifully designed and which was offered as first prize in the New York-Seat-the race, won by the Shawmut.

The city of Atlanta has hung up a speedway trophy that is a rival of Indianapolis'. It is styled the City of Atlanta cup and was won this fall by Disbrow in a Rainier, the distance of the race being 200 miles. Another speedway prize is the Remy brassard, a unique prize offered at Indianapolis by the Remy magneto people which carries with it a salary of $75 a week. Barney Oldfield in a Benz holds it. The road races of the Chicago Automobile Club at Crown Point, Ind., last June added two trophies to the collection. The Indiana was hung up in the small-car race and was won by Joe Matson in a Chalmers-Detroit, while the Cobe cup in the big race was captured by Louis Chevrolet. The prize in the Fairmount Park road race at Philadelphia was the Macdonald and Campbell cup.

James Gordon Bennett Cup

San Francisco put up the Portola cup for its chief trophy in its fall road carnival and it went to the Pope-Hartford driven by Fleming, who distinguished himself by not only winning his class but the free-for-all as well. Also contested for in California was the Ferris cup, in the big-car race at Los Angeles, in which the winner was Harris Hanshue in an Apperson Jackrabbit, who smashed the American stock car record to get it. The St. Francis Hotel cup, a unique emblem, was the bone of contention in a 300-mile track race at Tanforan, a California oval, the winner of it being Michener in a Lozier. The Lozier people also annexed another rich prize in the Sewall trophy which was offered for the car making the best mileage in the three 24-hour races run on the Brighton Beach track. The Lozier got it for breaking the 24-hour record. The Stoddard-Dayton won the Santa Rosa trophy in a California road race.

The Franklin company is proud of being the possessor of the Governor's cup, which as its name indicates was offered by the governor of Pennsylvania and which was won by Carris in an air-cooler in the reliability run of the Motor Club of Harrisburg last May. The Elmore is the possessor of a silver placque which was given as first prize in the Munsey tour. Other touring prizes of note were the Hower in the A. A. A. annual reliability which was won by Williams in a Pierce-Arrow, while the Detroit trophy for the toy tonneau class in the same run is in the possession of Jean Bemb, of the Chalmers-Detroit outfit. The Prest-O-Lite trophy was the main prize in the 250-mile race at the Indianapolis speedway of which Bob Burman in the Buick was winner. Burman also won the Vesper cup in his class at the Lowell, Mass., road carnival.

FAMOUS MOTORING TROPHIES
VANDERBILT CUP won by GRANT ALCO
ATLANTA TROPHY
CITY of ATLANTA TROPHY won by DISBROW-RAINIER
WHEELER & SCHEBLER TROPHY - NOT DECIDED
SANTA ROSA TROPHY won by NOONAN STODDARD-DAYTON
INDIANA TROPHY won by MATSON CHALMERS-DETROIT
ALGONQUIN CUP won by ZENGEL CHADWICK
FERRIS CUP won by HANSHUE APPERSON
PORTOLA CUP won by FLEMING POPE-HARTFORD
REMY BRASSARD held by OLDFIELD
COBE CUP won by CHEVROLET-BUICK

OF THE NEW TROPHIES OFFERED FOR COMPETITION THIS YEAR THE WHEELER & SCHEBLER AND THE CITY OF ATLANTA ARE OF THE GREATEST INTRINSIC VALUE, THE LATTER HAVING BEEN GIVEN BY THE GEORGIA METROPOLIS

CONTESTED FOR IN 1909
PREST-O-LITE TROPHY won by BURMAN BUICK
GLIDDEN TROPHY won by WINCHESTER PIERCE ARROW
DETROIT TROPHY won by CHALMERS
GUGGENHEIM TROPHY won by SHAWMUT
FAIRMOUNT PARK CUP won by ROBERTSON SIMPLEX
VESPER CUP won by BURMAN, BUICK
SEWALL 24 HOUR CUP won by MULFORD & PATSCHKE LOZIER
HOLLENBACK HILL CLIMB CUP won by BELCHER KNOX
GOVENORS TROPHY won by CARRIS, FRANKLIN
HOWER TROPHY won by WILLIAMS PIERCE ARROW
ST. FRANCIS HOTEL TROPHY won by MICHENER-LOZIER
GOLDEN WEST GRAND PRIZE RACE

GLIDDEN'S TROPHY HAS BEEN WITHDRAWN FROM COMPETITION BY A DECISION OF THE A. A. A.—THE CITY OF DETROIT TROPHY WAS PRESENTED BY THE CITY OF THE STRAITS —THE GUGGENHEIM CUP IS A TRANSCONTINENTAL TROPHY

Detroit Aims at Big Mark

DETROIT, MICH., Dec. 6—According to what the factory heads say when definitely questioned relative to their output for 1910 nineteen of the leading Detroit factories will build all told 123,000 motor cars for the next season's trade. All of these will be built before July 1. Although these statements have been generally heralded abroad, it is not believed by the more conservative that the total Detroit output for this period will exceed at the outside the 100,000-mark; in fact, real conservatives place it at 90,000. There is every reason to believe that this total will be reached because of the enormous rate at which deliveries are at present being made, many of the concerns already having exceeded the 2,000-mark in deliveries to date. The Cadillac company had shipped 1,900 of next year's models on November 29; between October 1 and December 1 Ford shipped 3,500 cars; 1,200 Hupmobiles already have been shipped; the Chalmers-Detroit people on November 27 sent out 1,473 of the 30s and 248 of the 40s; 1,129 of the new Hudsons already have been forwarded to agents, and last but by no means least the Studebaker concerns have shipped 3,000 of the E-M-Fs.

Big 1910 outputs and big deliveries up to date are not the only indications of the important part the Michigan metropolis will play in the industry next year, but hand in hand with these goes the unprecedented factory building era that began 10 months ago and still is running at the high-water mark. Over half of the big manufacturing plants are adding new buildings to accommodate the extra requirements and those which are not erecting buildings are adding to their present ones.

Packard Enterprise

The story of Packard enterprise already has been told in these columns. The floor space of this factory has been increased until it now reaches the mammoth proportions of 25 acres. All departments of the factory are working to the limit. Particular activity is being displayed in the body-building department in which the writer counted 100 limousine and landaulet bodies in different stages of construction. It is interesting to know that fully 75 per cent of these enclosed types are made for cars sold with open bodies for summer work, but which will be replaced by the enclosed types for winter use. There are over 5,300 employes in the factory at the present time. A novel new departure in it is the photographic department installed by E. Ralph Estep, advertising manager. In the space quarters set aside for this work a complete car can be quartered for photographic purposes, etc. The studio is managed entirely by Mr. Estep, who has his corps of developers, etc. This cites the value of photography in the car-selling realm.

Since its inception the Chalmers-Detroit company has tripled its manufacturing facilities. Originally there was but one building 500 by 90 feet; now there are three, the third one not yet completed. In the new building $150,000 worth of machinery will be installed and in this building 1,000 motors and gearsets for the 1910 cars will be manufactured. The company built 3,150 cars this year and will turn out 5,200 next season. Deliveries for next year began in July and at present the capacity is thirty-five to forty-five per day. The factory floor space totals 540,000 square feet exclusive of sheds.

The Hudson car, which is a closely-related product of the Chalmers-Detroit, with practically the same company officers, is being built in the old Aerocar factory where 50,000 square feet are available. The proposed output for 1910 is 5,000 cars, 1,129 of which already have been built. The daily capacity is now fifteen to twenty-five. Deliveries began August 1.

Both Studebaker Plants Busy

Two big arms of the Studebaker interests are located in Detroit, these being the E-M-F and the Studebaker-Flanders. The third is the Studebaker-Garford, made in Elyria, O. In all three factories the company announces it will build for next year 41,200 cars, divided as follows: 25,000 Studebaker-Flanders, 15,000 E-M-Fs and the remainder Studebaker-Garfords. The electric pleasure and commercial vehicles of this company are built in South Bend, Ind. The present E-M-F factory is a condensing of eight separate factories, Wayne, Northern, Detroit Pressed Steel Co., Western Malleable and Drop Force Co. and a Canadian plant at Walkerville, Ont. The present central plant is being enlarged so that it will cover 10 acres. The fiscal or manufacturing year of this concern began September 1 and by September 1, 1910, the 15,000 cars will have been shipped. The company is at present turning out 1,200 a month. The Studebaker-Flanders factory is built around the old de Luxe plant, incorporating with it the Malleable Steel foundry next door. A complete renovation of the factories is taking place and the Motor Age representative took a ride in the new Studebaker-Flanders car. In January 800 of these cars will be built; 1,200 in February; 150 daily after that to May, in which month the daily output will be 210.

The first Hupmobile runabout was completed in November, 1908, and 500 cars were delivered for the 1909 trade with 7,500 projected for 1910. The factory has a main building with 134 feet frontage and three stories high, and in addition are two wings each 350 by 50 feet, giving a total floor area of 50,000 square feet. Up to date 1,200 cars for next year have been shipped.

Detroit figures on manufacturing 123,000 cars for the 1910 market, the estimates being based on the following figures from the various factories in that city:

Studebaker-Flanders	25,000
Ford	21,746
Studebaker E-M-F	15,000
Cadillac	10,000
Brush	10,000
Hupmobile	7,500
Regal	5,500
Chalmers-Detroit	5,200
Hudson	5,000
Packard	3,000
Demot	3,000
Everitt	2,500
Warren	2,500
Abbott	1,000
Detroit-Dearborn	500
Krit	1,000
Owen	500
Welch-Detroit	500

Activity at Ford Plant

At the Ford plant the usual activities prevail. In the big factory on North Woodward avenue, which will be used as an assembly plant, radiators occupy the second floor and the remainder is used for storage purposes. Immediately in the rear of this a big machine shop is in course of construction. It is 840 by 140 feet, one story high and will be ready for occupancy this winter. This company has ordered parts for 21,746 cars, 3,500 of which were delivered by December 1. The new plant when completed will have a capacity of from 150 to 200 cars per day.

The Cadillac company has plans for from 9,000 to 10,000 cars for next year, 1,900 of which were delivered on November 29. This factory operates on a steady schedule throughout the entire year excepting for 2 weeks in the summer during stock-taking. The price of this car for next season has been raised, but a larger motor, larger tires and more equipment are included. This company reports that it has had 6,000 applications for agencies.

The Brush Runabout Co. has ordered parts for 10,000 cars for 1910 and began shipments on December 1. By January 15 the company will move into its new building. The company will soon have 38 acres of manufacturing site and seven buildings. The new buildings now being built include a machine shop 460 by 200 feet, saw-tooth construction; and a paint shop 340 by 200.

The Regal plans include an output of 5,500 cars. The factory is at present being increased by a four-story addition 257 by 160 feet; and a testing shed and storage space 130 by 100 feet. The company is building five and seven-passenger touring cars and by January 15 will have out a four-cylinder two-passenger car.

So much for the old firms which have been in business and already have made the City of the Straits famous as the world's motor car manufacturing center. Of the new crop the Everitt, the first model of which is out, deserves primary

Plans to Make 123,000 Cars

Nineteen of the Detroit factories aim at enormous output, but a conservative view of the situation makes it look as if the big total of 123,000 cars hardly will be reached by the makers of the City of the Straits. It looks as if the total would be nearer 90,000. Manufacture of the new models are well under way and already the following shipments have been made:

Ford	3,500
Studebaker E-M-F	3,000
Cadillac	1,900
Chalmers-Detroit	1,721
Hupmobile	1,200
Hudson	1,129

Lansing reports that the Reo will make 12,000 cars for 1910, of which number 3,950 have been delivered. The Oldsmobile plant plans on 2,000 cars, 500 of which already have been turned out.

attention in that William Metzger was a moving spirit in the E-M-F enterprise and he now has launched a new concern. The Metzger Motor Car Co. is unique in that it is a really co-operative corporation made up of fifteen representatives from as many sections of the country who have taken stock in the company and will be masters for Metzger distribution in their own fields. The Metzger plan came about in this wise: An advertising campaign was conducted and upward of 18,000 applications for agencies, etc., received from all parts of the country. This done, Mr. Metzger selected fifteen representatives from different parts of the country whom he considered good material to handle the entire factory output. These fifteen representatives spent 4 days in Detroit at the Metzger plant a week ago, saw the car and after deciding on the body to be fitted, signed up and all told took $125,000 stock in the company which has a capitalization of $500,000. Of this amount $300,000 already has been paid in. Some of the distributers are: C. A. Benjamin, Syracuse, N. Y.; F. S. Dey, Kansas City, Mo.; J. Bowman, Boston; W. Wayne Davis, Philadelphia, Pa.; H. F. Coler, New York; H. Harrison, Los Angeles, Cal.; Gibson Automobile Co., Indianapolis, Ind.; Githens Brothers Co., Chicago; Lincoln Automobile Co., Lincoln, Neb.; Security Automobile Co., Detroit, Mich.; Johnson-Fletcher Motor Sales Co., Denver, Col.; F. H. Cassiter, Fort Worth, Tex., and McArthur Automobile Co., Minneapolis, Minn. In addition to these two others will be nominated representing Ohio and the southeast. This Metzger company was formed on June 1 and incorporated September 20. Plans are to build 2,500 cars. The present factory facilities include 150,000 square feet floor space. A three-story brick building is being erected. One hundred cars will be built in January.

Old Name, but New Car

An old name, yet a new car, from Detroit will be the Welch-Detroit built in the old plant of the Oldsmobile company which has been entirely renovated, fitted with the latest machinery and now awaits instructions from Flint as to when the General Motors Co. will begin the building of the car. All of the blue prints have been finished. This car will be a seven-passenger 45-horsepower machine and not a copy of the present Welch car. There are 2½ acres of floor space.

The Abbott is a new product being built by the Abbott Motor Car Co., located in the old Northern factory. The company is capitalized at $300,000 and has C. S. Abbott, president; J. D. Phillips, second vice-president; A. T. O'Connor, secretary, and J. G. Utz, recently with the Chalmers-Detroit company, as designer. It is a four-cylinder 30-horsepower car, 1,000 of which are to be built before July 1. A new factory is now being built at Beaufort and Waterloo streets; it will be 600 by 155 feet.

Warren a Newcomer

The Warren Motor Car Co. is a new concern which will build 2,500 cars by June 1, these to be of the runabout and demi-tonneau type with a four-cylinder motor 4 by 4½ inches. Two cars are now on the road. The factory contains 50,000 square feet floor space. W. H. Radford, previously with the Oldsmobile, is designer. J. G. Beyerline, who designed the original Pope-Toledo steamer, is associated with the company.

The Detroit-Dearborn Motor Car Co. has announced that it will build 500 cars before July 1. The Detroit-Dearborn car, which for brevity has been dubbed the D-D, is a 35-horsepower four-cylinder car with five-passenger touring body. The company has 10,000 square feet of floor space for manufacturing facilities.

The Owen Motor Car Co. takes its name from Ralph Owen, who is general manager. Ed Turnbull is president and Angus Smith treasurer. The company has purchased 9 acres of land along the boulevard. Its present manufacturing facilities are confined to a 150 by 60 four-story factory. The Owen will be a four-cylinder 52-horsepower touring car, with a long-stroke motor and 42-inch road wheels. Material has been purchased for 500 cars. The first car will be out December 7. Twenty-five machines will be built in February, fifty in March and 100 a month afterward. This is the only one of the many new Detroit concerns which will bring out a high-priced articles, the others all catering to the great popular field.

The Krit car which has been broadly heralded for some weeks will be built in the Krit Motor Car Co. plant with 25,000 square feet floor space, the 1910 output being 1,000 cars. Of these 10 will be built in February, 200 in March and the output completed by July. The Krit is a four-cylinder 22.5-horsepower car built in the usual body types.

The Demot car has been on the roads for some months. At present the company announces it is building its rear axles in a 150 by 80-foot building and that it has bought the Sun stove factory which is being remodeled. There are 3 acres of land. The company will build a 100,000 square-foot addition. Plans are to have 3,000 cars completed by July 1. Fifteen already have been built and the arranged-for output is 100 in December, 200 in January, 400 in February and 700 per month thereafter. Guy Hamilton is the designer.

In the electric field the Anderson Carriage Co., maker of the Detroit electric, is displaying widespread enthusiasm. Deliveries are running at the rate of five per day.

Morgan & Wright, who established their tire factory here in 1906, have made remarkable strides since then. The original factory was considered adequate for 6 years, but at the end of 2 years new additions were started; this year one-third has been added to the floor space devoted to manufacturing. In the new three-story building erected ten huge hydraulic presses have been installed.

At Lansing the Reo and Oldsmobile are booming. The Reo company built 7,500 cars in 1909 and will manufacture 12,000 next year. Of this number 10,000 will be four-cylinder cars. Deliveries began October 1 and up to December 3,950 cars had been delivered. Present capacity is twenty-five per day. Two new buildings have been added, giving an increase of 350,000 square feet of floor space. A $50,000 emergency water tank has recently been erected as a double guaranty against fire. On November 30, when the company took an inventory, it had $1,500,000 of raw materials on hand. The factory includes a drop-forge plant. After January 1 the output will be sixty per day.

Activity of Oldsmobile

At the Oldsmobile factory a two-story building, 235 by 50 feet, has been erected as a testing place for assembled cars. Next year's output will be 2,000 cars, 500 of these being the six-cylinder Oldsmobile Limited and 1,500 the four-cylinder type. Deliveries on the 1910 cars began July 1 and 500 are already completed. The output now is ten to fifteen per day. The factory force numbers 1,200 men, part of which works until 9 p. m. 4 days in the week. The preparations for the 1911 cars are well under way at present. A new building is to be erected which will be 750 by 75 feet, two stories high with a three-quarter basement. It will be used for trimming, chassis painting and general assembly and will be ready May 1. The factory floor space at the Oldsmobile plant at present is 400,000 square feet.

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The Status of a Small Car

A LOW-PRICED car must be well-built, otherwise the repairs which will have to be made after the car is sold, and the attention the factory must give its buyers through its agents, will prove such a white elephant as to almost put the factory out of business if it is building cars above the 10,000-mark. It is cheaper today for a concern that anticipates building 8,000 cars to spend money putting in extra materials and extra workmanship and making a really good car than to use poorer materials, put in poorer workmanship and do poorer assembly work. If the job is properly done at the start the trouble after the car is sold will be reduced to a minimum; if the job is a poor one it may mean recalling hundreds of defective parts to the shop and the free replacement of them. The free replacement of the smallest part of a car in a 10,000 output soon attains enormous proportions because of the services and work necessary in the looking after such replacement work, not to say anything about the cost of manufacturing the part which has to be replaced.

THE annual profits of a concern cannot be based on the margin of profit on each car that leaves the factory; the true balance sheet cannot be compiled until the end of the year; and opposite the car profit must be entered the free replacements and free repairs that are made from time to time at the company's branches and agencies. In the past few years makers have found to their sorrow how much it costs to put on a carbureter that is too small to get the desired power out of the motor; or to fit a coil that is not wound to suit the requirements. These are but a couple of examples of what might happen and what has already happened to some makers. Today, however, the legitimate maker of the low-priced car is not making this error, and if he did with his 10,000 or 15,000 output he might as well close shop at once.

THIS moral of low-priced car construction, when the cars are built in large quantities, has not appealed to many manufacturers, nevertheless it exists and should have a salutary effect on the man who is buying or purposes buying a car of this type. Where the output of the maker is limited to a few hundred cars in a season it is not so certain a quantity as to the quality of material and workmanship that has been bestowed upon the product. This imperative demand of putting good workmanship and good material into the medium or low-priced car has been a vital factor in the policies underlying many of the present big builders of this type of car.

THE buyer of the low-priced car must not carry off the idea that this car is the equal of the $2,500 or $4,000 machine; far from it. The relative value remains among the several classes. Each has its field, and for the extra money in the big car there are materials, workmanship, comfort and finishing to account, to a large extent, for the difference. Alloy steels cost more and are more expensive to manufacturers than the carbon steels; the annular ball bearing is more expensive than the cup-and-cone ball type; the well-proportioned frame with its integral gussets and double drops is more expensive than the simple unbent side member; the ball-bearing steering knuckle costs more than the plain-bearing type; and their are a score or more of other differences between the high-priced and the low-priced machine to account to a large extent for the difference in prices.

The Mono-Man Passenger Car

FRANCE has brought out the one-man, or mono-man, motor car; which is specially suited for commercial uses. This is a most commendable innovation, chiefly for commercial purposes. There are today scores of concerns using motor cars in their salesman service and in which no more accommodation than that for the driver is needed. The commercial traveler is today looking for a car that is reliable and cheap in upkeep, and it is a certainty that a car built for one person will not weigh so much as one built for two on the same chassis. Weight in many cars is a large determining factor in upkeep, particularly in the tire bill. Besides, the one-man car being a lighter product, there is a business reason for its use in the commercial-traveler field. In general the commercial man has little use for an empty seat beside him. The company does not purpose making the vehicle a free-for-all stage to pick up this or that other pedestrian; rather it uses the car because it is cheaper; and how can it be made cheaper than by such a method as already indicated.

WITH a mono-seated car ample room can be provided for sample cases which could readily be carried in an enclosed rear compartment; and as yet few if any manufacturers have designed a light enclosed compartment suitable for such. The exact nature of this compartment would largely depend on the nature of the goods or samples carried. There is a big field for any maker of light cars to develop and the outlay would not be large. There are many travelers carrying light samples, who have during the present season used motor-cycles with the utmost success; and travelers not carrying any samples can use these light and speedy machines with the utmost success and economy. It may be argued that the single-seated car will not prove popular with the commercial traveler in that when he enters a town or city he wants an extra seat to accommodate a prospective purchaser, and that a short trip in a car with two seats might result in a sale that could not otherwise be closed. There is reason in this objection, but it rarely happens that a salesman would want to take a customer pleasure riding in a commercial vehicle.

DURING this season many wholesale firms in western states have been experimenting with the use of light runabouts for their salesmen and in every case the salesman has been required to report accurately and in the minutest detail the daily and weekly cost of operation. The wholesaler requires this. The business house will always require such and it behooves the car maker to consider carefully those points in design and construction which will tend to the elimination of certain expenses and the satisfactory reduction of others. The rural free delivery field is a broad one and can be excellently exploited along this line. In the vehicle used by the delivery man there is absolutely no necessity for the double seat and by doing away with it there is a big opportunity of so reducing the body weight that an attractive reduction can be made in the annual operating cost of the machine.

IN city delivery work there are scores of stores that need but a vehicle of 500-pound capacity for delivering their goods. On such vehicles the single seat is sufficient. The one outside seat in the taxicab is a good point in its make-up, as it can be copied to advantage in the small commercial vehicle for business needs.

MOTOR FEES BRING BAY STATE A FORTUNE

BOSTON, Mass., Dec. 4—An increase of very close to $50,000 over 1908 from the registration of motor cars shows what an enormous revenue is being reaped by Massachusetts even now from these vehicles, and with the horsepower rating going into effect January 1 that amount will be doubled no doubt. The highway commission received $121,500 from motor cars in 1908, and this year when the registrations had about 3 weeks to run there had been received $169,973.54. That it will turn the $170,000 figure the officials believe when the books are closed December 31.

In 1908 the commission registered 18,082 motor cars. The figures for the present year already have gone above 23,900. There has been a great increase in motor cycles, too, and now the number registered for the year approximate just about 10 percent of the number of motor cars. In 1908 there were 1,917 cycles registered, and this year so far 2,382 were booked. The increase in private operators kept pace with the general increase of everything else. Last year 5,865 operators were given licenses and this year their total reaches 8,336. The increase in chauffeurs has been noticeable, too, and from 2,343 last year their ranks have increased to 3,289. The renewals tell a similar story amounting to 6,626, from 4,962 of a year ago. The highway commission's officials made 4,630 examinations of persons who sought to get licenses as operators of cars during the year. A number of men had to take two and three examinations before they were passed.

Some idea how the revenue will increase under the new law is shown by the first few days of registration for 1910. The commission sent out to all those holding registrations from 1 to 5,000 application blanks so that those who have had low numbers for several years could get them again. As a result in 2 days the commission received and registered 27 cars. Under the old law this would mean an income of $135. But under the sliding scale it netted $395, or nearly three times as much. But two of the cars came under the old rate of $5 while six were at $10, twelve at $15, six at $20 and one at $25 each. This would seem to indicate that most of the machines to be used during the winter will be about 30 horsepower.

In the application blanks sent out by the commission for registering the motor cars it says "The Massachusetts highway commission expressly reserves the right to make special determination of the horsepower of any motor vehicle sought to be registered, but in general, until otherwise determined the fees will be as follows: Motor cycles, $2; commercial vehicle, $5; under 20 horsepower, $5; from 20 to 30 horsepower, $10; from 30 to 40 horsepower, $15; from 40 to 50 horsepower, $20; from 50 horsepower up, $25.

Early Returns Show Vast Difference in Receipts when Cars Are Taxed By Horsepower

Some of the motorists are now wondering whether the statement about "special determination" means that they will get a chance to show that their cars are not as high as the commission rates them, or that it means the commission will give special tests to cars that seem to be underrated. No allowance is being made for old cars and so a man with a model of 1904, for example, will find himself paying as much as the man with the 1910 model if the bore and cylinders are similar. There is quite an awakening in store for a lot of motorists who have not yet realized what the new law means. For instance, the man whose car rates just 30 and figures on getting into the $10 class will be assessed $15. So with the others upward. The formula will throw a few of the makes into classes above that figured on by their owners, and there is apt to be a howl go up next month, and members of the present legislature who are returned this year will doubtless be asked some questions by constituents who are motorists relative to why the bill was allowed to get by.

The blanks for motor car registration have a lot of information on them, not the least interesting of which is the formula on the back where the bore and cylinders are given showing the rating each car will be given by the commission. There are some elaborate questions, and the owners of cars that are under 10 horsepower and have not had extra brakes applied as called for under the new law, will have to send their cars to the junk heap or spend a lot of money to equip them. The other alternative is perjury. Pertinent facts in connection with these blanks are:

For registration applied for during the period beginning with October and ending on December 31, one-half of the foregoing fees will be charged. For short term registration of motor cars owned by non-residents, the certificates being in force only during July, August and September, one-half of the foregoing fees. For the substitution of the registration of a motor car for that of a motor car previously registered in the same calendar year, $2, provided the horsepower of such vehicle is the same as that of the motor vehicle first registered; but if the horsepower of the motor car is greater than that of the motor car first registered, the applicant shall pay, in addition to the said fee of $2, the difference between the fee paid by him for the said vehicle first registered and the fee for the registration of the motor car of the higher horsepower. For the substitution of the registration of a motor cycle for that of a motor cycle previously registered in the same calendar year, $1.

A person who before August transfers the ownership of a motor car registered in his name and who applies for the registration of another motor vehicle of less horsepower than that of the vehicle so transferred, shall be entitled, upon payment of a fee of $2, to a rate between the respective fees for the higher and the lower horsepowers, and a person under like conditions who does not apply for the registration of another motor car shall be entitled to a rebate of one-half the fee paid for the registration of such vehicle; provided, however, that no such rebate shall be paid except upon a certificate filed with the auditor of the commonwealth setting forth the facts, and signed by the commission.

Register number plates are furnished by the commission, no charges being made for them. Express charges thereon are paid by the receiver. The use of number plates of private design is not permitted. The certificate of registration of a motor vehicle expires at the end of the calendar year in which the certificate is issued or at the time of transfer of ownership of the vehicle if before the end of the calendar year. Upon the transfer of ownership of any motor car or motor cycle, its registration shall expire, and the person in whose name such vehicle is registered shall forthwith return the certificate of registration to the Massachusetts highway commission with a written notice containing the date of such transfer of ownership, and the name, place of residence and address of the new owner.

Each time ownership of a motor vehicle is transferred, registration by the new owner thereof is necessary if the vehicle is to be operated on the highways. All the statements in the application shall be made under oath or affirmation. If a motor vehicle is to be registered in the name of a company, copartnership, association or corporation, the name of the concern should be signed to the application and below it should be written the word "by" and the signature of the person filing the application.

The application blanks for operators have been gotten up with some clever questions framed in them. When they are all filled out they will make a notable collection of statistics on the habits of the motorists of the Bay State. As all licenses expire December 31, this means renewals all along the line, and so the blanks are going out in hundreds. Renewals will cost 50 cents each. In these blanks an applicant must give statistics as to height, weight, sex, birth, eyes, hair, color, etc. A drinking habit must be stated. Convictions since January 1, 1908, or 2 years back, must be given, a point that may cause some trouble later when motorists wish to forget the experiences they have had with rural policemen. All this must be sworn to and then three certificates of good character are appended to be filled out by the applicant for a license.

Coming Motor Events

DECEMBER

17-18—Record trials on the Indianapolis speedway.
25-Jan. 1—Show at Columbus, O.
31—Opening of Grand Central palace show, New York.

JANUARY

7—Closing of Grand Central palace show, New York.
8-15—Madison Square garden show, New York.
17-24—Philadelphia show.
24-29—Show at Portland, Ore.
24-31—Show at Washington, D. C.
24-29—Ninth annual Detroit show.

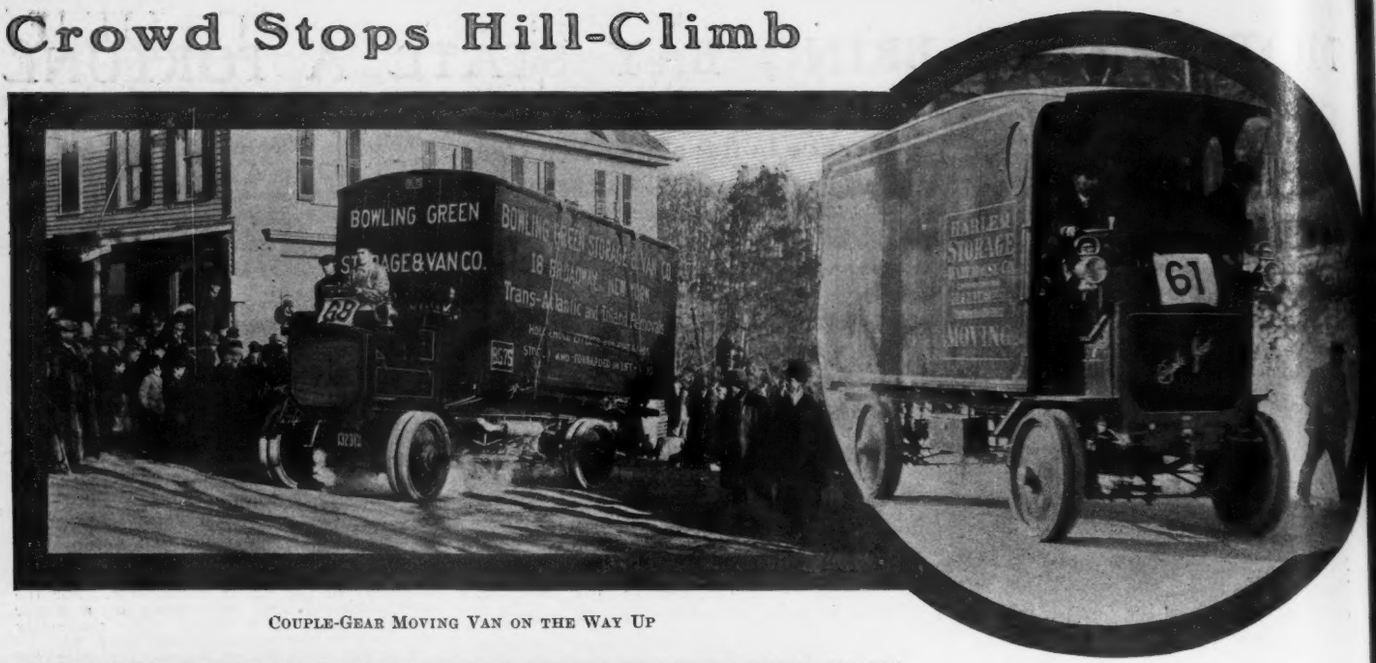
FEBRUARY.

4-6—Mardi Gras track meet, New Orleans.
5-12—N. A. A. M. show, Chicago Coliseum.
14-19—Show at Hartford, Conn.
14-21—Show at St. Louis, Mo.
14-18—Annual show at Buffalo.
19-26—Show at Newark, N. J.
19-26—Inter-mountain show, Salt Lake City, Utah.
21-26—Show at Binghamton, N. Y.
21-26—Annual Cincinnati show.
22-27—Milwaukee show.
28 to March 5—Show at Kansas City.

MARCH

5-12—Boston show.
21-28—Denver Motor Club show.

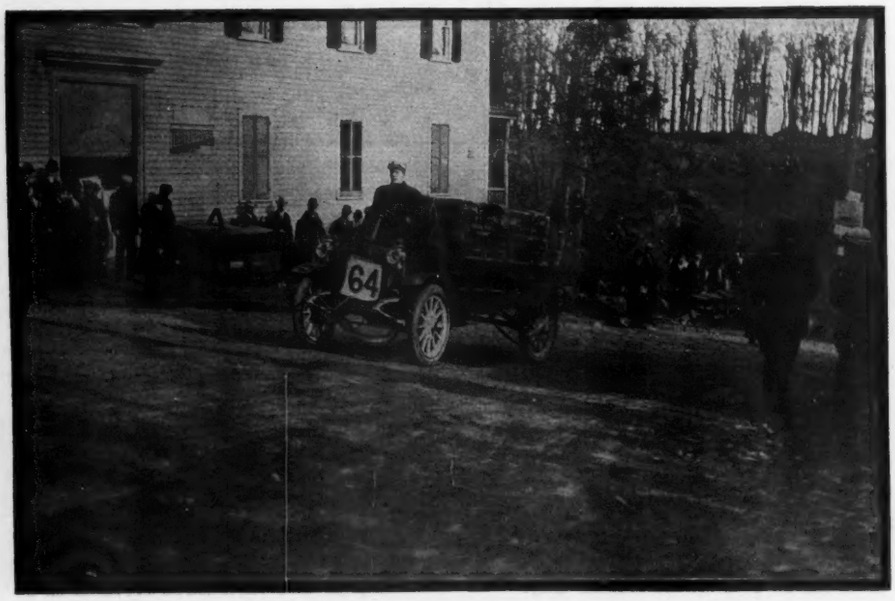
Crowd Stops Hill-Climb



COUPLE-GEAR MOVING VAN ON THE WAY UP

COUPLE-GEAR'S OTHER ENTRY

RENAULT MOTOR DELIVERY WAGON IN CLIMB



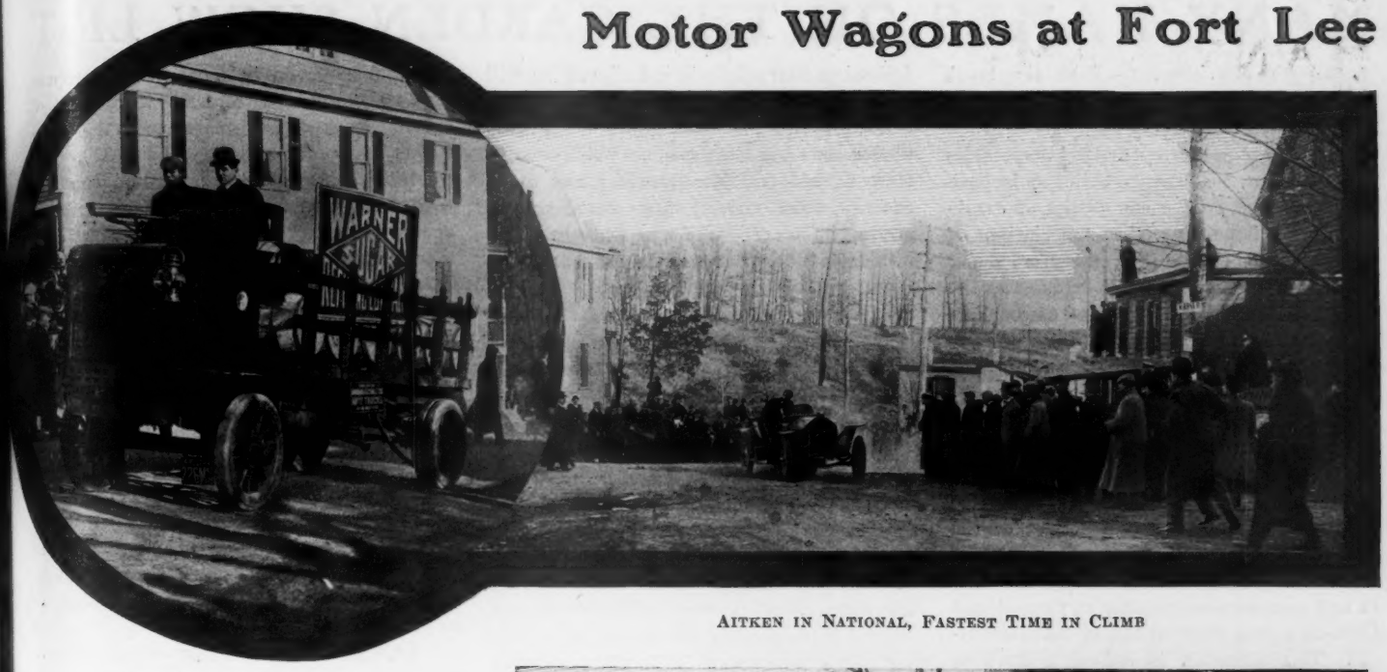
BUICK, WINNER OF CLASS A, COMMERCIAL DIVISION

NEW YORK, Dec. 6—The postponed Edgewater-Fort Lee hill-climb was held today, but the sport was marred by the crowds which overran the course and which compelled the promoters to abandon the contest before half the card had been run. The course, which was 3,000 feet in length, started in Edgewater and finished in Fort Lee, N. J., the affair being run under the auspices of the Edgewater-Fort Lee Automobile Association and under the management of the Motor Contest Association. Hardly had the meet started before it became apparent that the police protection was insufficient. The spectators persisted in getting on the course and occasionally an obstreperous teamster would insist on crossing the course regardless of whether or not any of the cars were ascending the hill at the time. Luckily for the promoters there were no serious accidents, but soon it became apparent there likely would be some unless the sport was stopped. There was one consolation, however, and that was that darkness would have cut short the card even if the spectators had not.

The feature of the meet was the work of the commercial trucks and delivery wagons, provisions for which had been made in the way of two classes. Class A was for commercial delivery wagons up to 1 ton capacity and the winner was a 20-horsepower Buick which went up in creditable time. Class B was for trucks up to 2 tons capacity and in this the 24-horsepower Walter proved speediest. One of the Couple-Gear trucks was a veritable leviathan—a moving van—and while it required nearly 11 minutes to make the ascent it got to the top in good shape amid the cheers of the spectators.

Up to the time that the tests were called off some excellent performances had been recorded, one of the best being the

Motor Wagons at Fort Lee



AITKEN IN NATIONAL, FASTEST TIME IN CLIMB

AMERICAN TRUCK IN CLIMB

56.57 seconds of the 40-horsepower National, driven by John Aitken in the event for gasoline stock cars, selling at $2,001 to $3,000. The National cars had all the honors of this test, as Frank Hurmance gained second place with a 45-horsepower machine of similar make in the time of 1:08.57.

Quite a feature of the meeting was the use of a new electrical timer. The instrument is so arranged that it automatically prints the time of each car as it crossed the start and finish lines even to the one-hundredth part of a second. This was the first time that the machine had been used in a hill climb. The summary:

CARS SELLING AT $850 OR LESS

Make, horsepower and driver	Time, M. S.
Ford, 20, J. J. Berthoff	1:07 15-100
Cameron, 24, F. F. Cameron	1:14 64-100
Empire, 20, E. C. Walker	1:46 60-100

CARS SELLING AT $851 TO $1,251

Cameron, 24, F. F. Cameron	1:08 83-100
Buick, 18, C. Ewing Easter	1:13 31-100
Hudson, 20, George Ainslie	1:16 1-100
Cartercar, 22, A. E. Bloom	1:17 20-100
Hudson, 20, Robert W. Fulcher	1:18 11-100
Maxwell, 22, T. C. Wolverton	1:31 20-100

CARS SELLING AT $1,251 TO $2,000

Buick, 30, Arthur Warren	1:02 70-100
Selden, 36, Louis Warren	1:10 30-100
Pullman, 30, F. Cimcotti	1:16 70-100
Auburn, 35, J. J. Meyer	1:22 40-100
Petrel, 30, Harrison H. Boyce	1:27 60-100

CARS SELLING AT $2,000 TO $3,000

National, 40, John Aitken	0:56 57-100
National, 35, Frank Hurmance	1:08 97-100
Selden, 36, Richard Carter	1:12 10-100
Pope-Hartford, 40, J. E. Blakeslee	1:13 27-100
Grout, 40, P. H. Johnson	1:20 22-100
Knox, 38, James Westervelt	1:26 90-100
Walter, 24, W. Walter	1:43 50-100

CARS SELLING AT $3,001 TO $4,000

American, 40, L. C. Howard	1:04.47

CARS 300 CUBIC INCHES OR LESS

Lancia, 20, F. Strobel	1:06.1
Lancia, 20, W. Hilliard	1:11.53
Lancia, 20, C. Tangeman	1:15.27
Lancia, 20, H. Fosdick	1:20.12
Nagant, 24, S. Otto	1:27.6

COMMERCIAL, CLASS A

Buick, 20, E. H. Taylor	2:34 48-100
Renault, 14, Joseph Street	No time taken

COMMERCIAL, CLASS B

Walter, 24, E. Walter	2:56 26-100
American, 55, Albert Defrietas	5:15:27-100
Couple-Gear, 40, Howard Green	6:15 98-100
Couple-Gear, 40, Harold Church	10:59 92-100

WARREN IN BUICK, ONE OF THE CLASS WINNERS

F. F. CAMERON DRIVES A CAMERON TO VICTORY

MANY NAMES ON THE GARDEN SHOW LIST

NEW YORK, Dec. 6—That the tenth show in Madison Square garden, January 8-15 will eclipse any former exhibition of motor cars, motor cycles and accessories ever held in the famous building is positively assured by the official list of exhibitors just issued by the Association of Licensed Automobile Manufacturers under whose auspices the show is held. The list shows a total of 323 different displays of which there are fifty-four exhibits of complete cars, besides 246 exhibits of accessories and parts, and twenty-three motor cycle exhibits.

Even with an increase over last year of more than 7,000 feet of exhibition space which the show managers by ingenious methods were able to squeeze out of the garden interior, there is not a foot of space available for exhibition purposes to be had in any part of the building at present and there is a long waiting list of manufacturers. This situation is indeed a striking commentary on the growth of the industry when it is realized that at the first show held in this country in 1900 there were only sixty exhibitors who displayed their product in the garden.

As in previous years this show of the standard makers of licensed cars has been departmentized so that visitors may find more readily those things which most interest them. On the main floor and elevated platform will be found only gasoline pleasure cars. Electric pleasure vehicles are to be exhibited in the exhibition hall off the foyer at the Madison avenue end. The basement will be occupied by commercial vehicles, motor cycles and the overflow accessories. The concert hall, balconies and elevated platform will accommodate the exhibits of accessories. Visitors to the garden show will be agreeably surprised at the distribution of exhibitors which will give the impression of a vast space not uncomfortably filled with cars and allowing plenty of elbow room.

REEVES A. L. A. M. MANAGER ?

New York, Dec. 6—It was reported from Detroit today that Alfred Reeves, of New York, has been tendered the position of general manager of the Association of Licensed Automobile Manufacturers, which carries with it a salary of $15,000 a year. Rumors to this effect got into circulation here soon after the decision of the Selden patent suit, but now it can be stated definitely that the offer has been made. Mr. Reeves for the past 4 years has been general manager of the American Motor Car Manufacturers' Association, which has opposed the licensed makers, but since the practical settlement of the patent controversy many of the independent makers have joined the A. L. A. M. or secured licenses, and others are expected to follow. The annual Grand Central palace show in New York is managed by Mr. Reeves, but following that affair it is believed he will assume his duties with the licensed association, provided he decides to accept the tender that has been made. When seen in New York today Mr. Reeves asked to be excused from making any statement regarding the report from Detroit. He would not deny that an offer had been made, but insisted that he would be manager of his present association for some time to come, and would complete his work in connection with the palace show.

GAS TANK MEN IN COURTS

Milwaukee, Wis., Dec. 6—The Prest-O-Lite Co. and the Commercial Acetylene Co., of Indianapolis, Ind., have filed suit against the Auto Lux Mfg. Co., of Milwaukee, and Percy C. Avery and George E. Burnham asking for an accounting of the defendants' profits arising from an alleged infringement of patent, and praying for a permanent injunction. Judge Quarles, of the federal court, has issued a temporary injunction. The suit is partly an outgrowth of the explosion which on November 29 wrecked the plant of the Gas Tank Recharging Co., at 961 North Water street, Milwaukee, in which George L. Odenbrett, member of Bates-Odenbrett Automobile Co., was killed and two employes injured. It is charged that the Auto Lux Mfg. Co. sold to the Gas Tank Recharging Co. a generator which infringes on the patents of the two complaining companies. In the wreckage of the Odenbrett recharging depot were found several bills for two cans of carbide, which are used as exhibits in the infringement case.

St. Louis, Mo., Dec. 6—The Prest-O-Lite Co. has entered suit against Charles Marien, O. O. Petty, William Krueger and Frank Bishop, of the Auto Gas company, to enjoin them from doing a tank-refilling business. The matter will be heard in the circuit court in a few weeks.

Indianapolis, Ind., Dec. 7—According to a statement issued by the Prest-O-Lite Co. suits have been filed against the following: Auto Acetylene Light Co., Cleveland, O.; Detroit Tire Repair Co., Detroit, Mich.; Auto-Lite Co., Chicago; E. A. Jenkins Co., Columbia, S. C.; Gas Tank Recharging Co., Milwaukee, Wis.; Autogas and Compressed Air Co., St. Louis, Mo.; Kansas City Gas Supply Co., Kansas City, Mo. It is claimed no other concern besides the Prest-O-Lite Co. has the right to refill Prest-O-Lite tanks.

INDUSTRY BIG IN INDIANAPOLIS

Indianapolis, Ind., Dec. 6—Will H. Brown, vice-president of the Overland Automobile Co., has been doing some figuring on the fact that 20,000 motor cars will be manufactured in Indianapolis during the 1910 season. He says: "The present motor car manufacturers in Indianapolis, eleven in number, are preparing to build and already have placed orders for stock and parts to make over 20,000 cars during the year 1910, the Overland Automobile Co. heading the list with 8,000 cars to be made in its Indianapolis factories. All of these cars will be shipped from the local factories by the latter part of August, 1910, at the very latest. Let us stop for a moment and consider what 20,000 cars a year means in cold figures.

"There are only 300 working days in the year, so sixty-seven cars must be turned out each one of these days, or nearly seven cars an hour to be shipped from Indianapolis. An average of two and one-half motor cars will be shipped in a freight car, and so 8,000 freight cars, or 320 freight trains of twenty-five cars each will be required to carry those motor cars to their destination.

"This means an average of about two trainloads composed entirely of motor cars will leave Indianapolis every day during the coming year. These 320 trains, if coupled together, would reach 77 miles. The 20,000 motor cars, if placed end to end, each car just touching the car ahead, would make a string of cars 50 miles long. In order to turn out these 20,000 cars, at the very least 5,000 men will be directly employed in their manufacture; besides many thousands in accessory parts, castings and the handling of steel and other raw material, which will be done by various Indianapolis concerns. This does not include the men employed in the local hardware and other similar concerns, who have men putting in their whole time filling orders for the motor car industry.

"These 20,000 cars represent a value of $35,000,000, most of which will be handled by the Indianapolis banks, and a considerable portion will be paid as wages to our fellow townspeople who are engaged in this great industry."

CHANGE IN SPEEDWAY DATES

Indianapolis, Ind., Dec. 6—With the sanction of the American Automobile Association, directors of the Indianapolis motor speedway have decided to hold a race meet on the course December 17 and 18, instead of this week. At this meet efforts will be made to lower all of the records recently established at the Atlanta speedway meet. The brick pavement on the course will be completed some time this week, and will be sealed with a gold-plated brick. A concrete wall 3 feet wide and 12 inches thick has been built around the course, and new grandstands have been erected. With favorable weather it is believed large crowds will be attracted to the initial meet over the only brick course in the world.

With the completion of the brick pavement, the company will have spent about

$700,000 on the speedway project. Trips over a portion of the course have indicated that unusually fast time is possible and running at high speed there practically is no vibration felt by occupants of the car. The meet program will include events for ¼, ½ and 1 mile and also for 1 kilometer and longer distances. There will be numerous events for cars of all classes under the rules of the A. A. A. It is probable that among the events will be a 200-mile race for cars of from 451 to 600 cubic inches piston displacement. Walter Christie and Lewis Strang already have shipped their cars to Indianapolis and will be among the first to take advantage of practice when the track is completed. It is expected that practically all of the drivers who took part in the Atlanta races will appear on the local course. The Nordyke & Marmon Co. has announced already its intention of entering cars to be driven by Stillman and Harroun. A 1,000-mile race, with frequent changes of drivers, is contemplated, among other events.

Dates for meets at the speedway for 1910 have been applied for as follows:

May 27, 28 and 30—Motor car races.
July 1, 2 and 4—Motor car and balloon races; the international balloon races to be held on July 4.
July 23—Aviation meet for foreign and American aviators.
August 12 and 13—Motor car races, including 24-hour race.
September 3 and 5—Motor car races.
October 7 and 8—Motor car races.

CHALMERS WINS MATCH RACE

Philadelphia, Dec. 6—At Point Breeze last Saturday afternoon, Harvey Ringler, in his Chalmers-Detroit, won the 50-mile match for a $1,000 purse from Ira Brown, who drove a Buick. Ringler covered the distance in 59:46½. Brown's car early developed magneto trouble and besides sprung a radiator leak, the handicap resulting in the withdrawal of the Buick in the thirty-fourth mile. On his ninth mile Ringler, in endeavoring to lap his opponent, veered into the fence at the turn beyond the grand stand, and after leveling a half-dozen panels, managed to get his car back on the track again and uninjured. When the Buick quit it was 9 miles behind the Chalmers-Detroit. In a preliminary 5-mile event a Packard beat a Renault in 7:18.

THOMAS WINS AT SAN JOSE

San Jose, Cal., Dec. 1—Five thousand motor enthusiasts on Sunday saw the last race meet of the season in northern California. The contests were held on a new course which has been built by the San Jose Driving park and the crowd was drawn from Santa Clara and San Francisco counties. The meet did not come up to expectations owing to the failure of many of the cars that had been promised to appear, but at the same time there were some interesting features. The 50-mile free-for-all race for stock chassis was the best race of the day. The competitors were a Thomas six entered by Charles A. Warren, a young capitalist of San Francisco, and driven by W. H. Turner; a Buick 40 driven by Frank Murray; a Lozier, entered by Stanley Ketchel, the middle-weight champion of the world, and driven by G. A. Seeley; a White gasoline car entered by the White Co. and driven by E. B. Ely, and a Comet car driven by Harold Hall. The Comet took the lead in whirlwind fashion and finished the first 10 miles in 9:30 according to the timers—but it must be remarked that the timing system was not of the most approved fashion, only two watches being held. Hall maintained this lead until the fifteenth mile, having during that time gained a full lap on the Lozier, which was running in last place, when a puncture forced him to withdraw temporarily. Murray in the Buick, who was following close on Hall's trail, took the lead and held it until the nineteenth mile, when his motor failed and he withdrew, allowing the Thomas six to gain first place. Turner kept his car to the front for the remainder of the race, although the Buick, which was again in the running after the Thomas had gained a lead of 2 miles over it, was close behind the winner and gained second place, a full ⅓ mile ahead of the Lozier. The latter just succeeded in beating out the White gas car. The Thomas' time for the half-century was 52:07. Summaries:

Five-mile match race, two-cylinder cars—Ned McGehee, Lambert, won; L. H. Hueter, Maxwell, second.
Five-mile, stock chassis, $800 to $1,500—H. Hall, Comet, won; Frank Murray, Buick, second; G. Darby, Buick, third. Time, 6:22 2-5.
Ten-mile, stock chassis, $1,500 to $2,500—H. Hall, Comet, won; Frank Murray, Buick, second; E. B. Ely, White gasoline, third. Time, 10:39 2-5.
Fifty-mile, free-for-all, stock chassis—W. H. Lener, Thomas six, won; Frank Murray, Buick, second; G. A. Seeley, Lozier, third. Time, 52:07.

New York the A. A. A. Hub; Glidden Trophy Dropped

New York, Dec. 8—Not the least of the important results accomplished at the annual meeting of the American Automobile Association last week was the consolidation, as it might be called, of the more important offices of the association in New York city. The contest board under the chairmanship of Samuel M. Butler, the official headquarters of the A. A. A. publication, the American Motorist, under the editorship of A. G. Batchelder, and the touring information board, although the latter still remains under the chairmanship of Powell Evans of Philadelphia will hereafter be located at national headquarters, 437 Fifth avenue, New York, additional room having been secured to accommodate this accession to the working force of the main office. The legislative board under the chairmanship of Charles Thaddeus Terry has had its headquarters in New York for some time, so that now every important phase of the A. A. A.'s work with the exception of the good roads board, under the chairmanship of George C. Diehl of Buffalo, will be centered in New York city.

Among the important recommendations, all of which met with favor, as shown by the consolidation of the offices, and the creation of the new office of chairman of the executive committee which originated with the president, was one that probably will materially change the methods although not the objects of the annual Glidden tour. Mr. Speare suggested that instead of this annual event being known hereafter under that name the national tour should be conducted as the American Automobile Association national endurance run and that the Manufacturers' Contest Association be requested to draw up rules for such a run at the close of which every entrant shall be given a certificate of performance made in accordance with the rules adopted by the manufacturers, but that no trophy be awarded to any contestant. This met with general approval and a special committee of three, of which Mr. Speare was asked to be chairman, was appointed to confer with Mr. Glidden regarding the disposition of his trophy. It may be interesting to note that the subject has been discussed with Mr. Glidden and he has stated his hearty accord with any arrangement for the disposition of his trophy which may be for the best interests of the motorists.

FIND TWO COBE COURSES

Milwaukee, Wis., Dec. 6—President M. C. Moore, of the Wisconsin State Automobile Association has submitted to the Chicago Automobile Club two proposed courses for the next Cobe cup race. Both are in Walworth county, which touches the Illinois line at its southern boundary. Whitewater, the nearest city, is approximately 85 miles from the center of Chicago and 45 miles from Milwaukee. One course, as laid out by President Moore and H. L. Halverson, vice-president of the W. S. A. A., who resides at Whitewater, is practically square and 4½ miles long, with an extra wide and recently improved roadbed. The other course is 6 miles long, one leg of which touches the southeast limits of the city of Whitewater. The roadbeds are wider than the ordinary Wisconsin country road and are particularly free from gullies and deep ditches at the sides. Another good feature is that there are no villages or cities to interrupt the free use of the road, every part of the distance being in the country. Janesville, Beloit, Elkhorn, Fort Atkinson, Delavan, Jefferson, Burlington, Racine, Kenosha and numerous other towns and cities of pretentious size are within easy striking distance. The Wisconsin State A. A. is anxious to get the Cobe cup race and will do everything in its power to arrange the details so the C. A. C. will have only to hold up its end. Even if the Cobe race should go elsewhere, the association plans to hang up a cup for competition on one of these courses.

Small Four Is European Tendency

PARIS, Dec. 1—Having viewed the sights of the Olympia show, and seen what France has to offer, Russell Huff, chief engineer of the Packard Motor Car Co., now is in Belgium looking around before he returns home. Mr. Huff's visit to Europe has been well worth the while, he declares, and he sums up his inspection tour as follows:

"The tendency in Europe is towards small four-cylinder low-powered cars. The European makers have stopped building large cars altogether. Simplification is being pushed to a very fine degree, the parts being reduced as low as possible in order to make the car cheap to produce in the first case and easy to maintain when in the hands of the private owner. The shaft-driven car almost has gone out of business. In England there is a strong tendency towards worm drive, in place of bevel gear. I particularly noticed that there is no boom in six-cylinder cars. I made a list of all the firms having formerly made six-cylinder cars in rather important numbers, and which did not show them this year. There were seven or eight firms which have abandoned the six. On the other hand every firm of importance has brought out a small four-cylinder car of about 12 to 20 horsepower, and in each case this small model is made the leader. Where sixes still are shown they are very small engines, as the Delaunay-Belleville and the new Renault. Taking an average, the American engineering standard is quite as high as that of Europe, while in the matter of steels we have got far ahead of the European constructor.

"Both in France and England the commercial vehicle business seems promising. All kinds of firms having any considerably amount of haulage to do have changed from horses to power vehicles. Taxicabs and motor omnibuses have put the horse variety entirely out of business. The European taxicab is a very light vehicle, generally with two cylinders in London, and often with only one cylinder in Paris. It is declared that owing to keen competition not much money is being earned by the London taxicab companies, although the vehicles are certainly very popular.

"There is a strong tendency in England towards the adoption of what is known as the torpedo type of body. It is straight-line body, with as little resistance as possible combined with maximum protection against the wind. The cars have high side doors for both front and rear seats, while the seats are set very low to give the passengers full protection. Wire wheels, of the dismountable type, are also a popular feature in England.

"Although business generally seems to be good, the volume of trade is far short of that in the United States. Whereas we at home doubtless will turn out 200,000 cars next year, the estimated product of the combined English factories is only 12,000 cars. When the European buys a car it generally is kept for a number of years. There are scores of cars doing good service in Paris which came out of the factory 6 or 7 years ago. They have had their body work changed from time to time, and often carry closed limousines, and they have been freshly painted when they needed it. Nevertheless they are old-fashiond models that the American motorist would be ashamed to drive.

"European touring is as popular as ever among Americans. As an indication, our own Paris branch has been in touch with over 200 Packard parties during the present season. The transportation companies take care of the cars so thoroughly, and the various touring bodies have so simplified the formalities that there is nothing difficult about a motor trip through Europe. There is a charm about foreign travel that appeals to our people, and will certainly cause them to visit Europe every year in increasing numbers. There are good roads, historic interest, fine scenery, architecture, and quaint customs that cannot be seen at home.

"One point of interest to the American visitor is the comparatively small life got out of tires on the hard macadam roads of Europe. I was told in England that 2,500 miles out of a steel-studded non-skid tire was considered very satisfactory service. Being very hard and dust-proof, the wear naturally is very much greater than our softer American roads.

"There does not appear to be much possibility of business with Europe for other than the makers of cheap popular cars. The market is so small that none of the first-class makers is likely to bother with it. Quite a number of American cars are sold in England, and appear to sell well. Practically none is sold in France. In every case those who have got the business are makers of the cheaper moderate grade cars."

ATTENDANCE AT OLYMPIA

London, Nov. 25—During the first 7 days of this year's Olympia show there were 165,470 visitors, or an average of 23,640 daily. In 1908 the attendance for the first 7 days was 129,178, or an average of 18,454 daily. With a probable attendance of 30,000 on the closing day, the daily average this year will have been close to 24,500. An attendant who has been connected with nearly all the Olympia shows said: "There have been nearly as many French, German, Belgian, Italian and other continental visitors this year as during the preceding 5 years put together. The French element was especially strong. There is no doubt but that a large number of these visitors never would have seen the Olympia show if the Paris salon also had been held this winter. Needless to say, the show committee and the British makers in general are well satisfied. In fact, I have heard some remarks about trying to break the Anglo-French show arrangement, which, if observed, means no show in London next year. Will it be so? It may, but there is bound to be an outcry after this successful show just concluded."

MISS THE PARIS SALON

Paris, Nov. 25—What a gloomy face the average French trade man is making these days. It seems as if some great calamity has visited France. To be short and to the point, let it be known that the French makers are realizing they made a big mistake by taking the Paris salon off the calendar and giving all the glory, the business and the bright prospects of the future to the British makers. There is no telling yet just how far-reaching the error of judgment of the anti-salon crowd will be, but a glance at what was done across the channel in the big Olympia hall during this last historical motor car show convinces the average observer that the British makers reaped a harvest of business which should have gone to the French makers. Not that the houses from France which did exhibit in London failed to land any business. No. Some of them did well, but all did not, and the argument of the Britishers at home worked to perfection. Six months from now it will be possible to get a real idea of the results. And there is no question even now that the majority of constructors of France now bitterly regret they did not heed the sound and wise advice of Marquis de Dion, who always was in favor of holding the annual Paris show.

FRENCH EXPORTATIONS

Paris, Nov. 20—During the first 10 months of 1909 French motor car manufacturers have exported cars valued at $24,232,000 as against a value of $22,029,600 in 1908. The increase this year is thus so far $2,202,400. The biggest increase of business has taken place in Belgium, the Belgians having spent an additional $1,305,800 on cars this year so far. The greatest decrease is shown in the trade with the United States, the exports to that country having dropped off $626,800 in 10 months. A big increase of business came from Russia, the amount showing a gain of $165,900 for 10 months over last year's business. Great Britain continues to be the best customer, taking nearly half of the entire amount. Yet, the total of $10,638,400 shows an increase of only about $110,000 over last year.

ENTER FRENCH TRIALS

Paris, Nov. 24—With the exception of one important manufacturer, Peugeot, all other leading small-car builders of France have entered for the winter reliability trials. Entries are closed now and thirty-three cars have been named by fourteen

different manufacturers.. These cars with those drivers already named are: Alcyon, 3; Barre, 3; Corre-La Licorne, 3; Demeester, 1; Delage, 3; Doriot-Flandrin-Parant, 3; Fouillaron, 1; Gregoire, 3; Hurtu, 2; Max-Anthoine, 1; Rolland-Pilain, 3; Sizaire-Naudin, 3; Turicum, 3; Zenith, 1. Six routes have been chosen, all having Paris as starting and finishing place. The first one leads to Sezanne and back, distance 125 miles; the second one to Evreux and back, 122 miles; the third one to Beauvais and return, 116 miles; the fourth route to Chartres and return, 112 miles; the fifth to Compiegne and return, 109 miles, and the sixth to Sens and return, 138 miles.

TRACK FOR STEVENS-DURYEA

Chicopee, Mass., Dec. 4—After 2 years of consideration and dealing with owners of property the Stevens-Duryea company is now in a position to realize one of its pet projects, the building of a special course upon which all Stevens-Duryea cars may be tested out under varying conditions. A strip of land 1 mile long and 100 feet wide has been secured, and with another piece of property 4½ acres in extent about to be purchased the company will have an ideal place for its car-testing. A track will be built at least 1 mile long and divided into two sections each 30 feet wide so cars may go in opposite directions at once. The whole track will be fenced in and roadways 25 feet wide built for the use of abutters. The entire length of the track runs between two country roads and does not cross a road of any sort from beginning to end. The land secured consists for the most part of gravel stretches and brush. The track will be built of brick or cement.

ITALIAN SHOW IN APRIL

Turin, Nov. 23—The seventh annual Turin motor car show will be held April 2 to 24. It will be the annual big Italian display at which the big French, German and Belgian car makers send their latest models. The show will be divided into three sections. In section 1 there will be pleasure and commercial vehicles, motor boats, motor car bodies, chassis and motors. In the second section will be located the parts and accessories for cars and bodies. In the third section will be found motor farming machines, industrial motors, wearing apparel and aeroplanes.

BROOKLANDS DATES SET

London, Dec. 1—The Brooklands Automobile Racing Club has announced the dates for its race meetings next year. The season will open on Easter Monday, March 28, with a 1-day meeting. The next fixture is a 2-day meet April 27-28. Only one Saturday meet has been arranged—June 18—the end of Ascot week. In addition to the meetings arranged there probably will be other events decided on the track, including an aviation tournament.

Mexico Promoting A 1910 Race

SAN ANTONIO, Tex., Dec. 6—Senor Andres Garza Galan has deposited with the committee of the International Club here a check for $1,000 as a prize for the winner of the Mexico City to San Antonio motor race that will be held as a feature of the Mexican centennial in September of next year. Senor Galan is one of the prime movers for this event. Besides being a prominent mine owner of Mexico, he is an enthusiastic motorist. This contest will be held under the auspices of the International Club of San Antonio, in association with the San Antonio Automobile Club. It will be a sanctioned event of the A. A. A. Speaking of the conditions now existing in the sister republic, Senor Galan said:

"Although there are now over 5,000 cars in Mexico, the field yet is comparatively unworked. Attention thus far has been paid only to the city regions, where the motor car is but a luxury. It is in the great ranch and farm region where the need of the quick transportation afforded by a motor car is felt. Miles of plains stretch in many sections where the going is like asphalt, and the good roads movement is gathering force. The American-built machines are decidedly in the majority now, the ratio being something like five to one. Only in Mexico City are the European cars to be found in any number, and even there those manufactured in the states are greater in number. There are several reasons for this. The American cars have been found better adapted to the rough going often encountered, their parts are more easily replaced when broken, and agencies are being located in most of the large cities. Then the American cars cost about one-half as much for the same grade as the European models, while giving better service.

"The European builders are not inclined to allow the American manufacturers to capture the honors unchallenged, however, and plans have been made to establish factories for the manufacture of European models in Mexico. The government will, of course, assist anything that will add to the commerce of the republic, and the labor problem is much the same as in Europe. This will have to be met by the American builders if they hope to hold their own. The country is well worth fighting for, as the ranch owners are alive to the benefit of owning a motor car and it is only the matter of a short time before the demand will more than double.

"In the movement for good roads Mexico is not backward. The capital rivals Paris in its asphalt boulevards, and now a road is being constructed from the City of Mexico to Puebla, a distance of nearly 200 miles. This is the case all over the republic, and the movement is growing in popular favor with the evidence of its benefit.

"The flag-to-flag trip next September is expected to add greatly to the interest in motoring in Mexico. Already I have had assurances that a Fiat and other European cars will be entered. The builders across the water are very eager to win this test, and it is up to the American manufacturers to hold the ground they have gained."

RACING IN ARGENTINE

Buenos-Ayres, Oct. 27—The annual kilometer championship speed trials of the Motor Club of Argentina Republic was held Sunday on the circular horsetrack located near Moron, about 15 miles from this city, the crowd numbering close to 12,000. This year the winner was again a Frenchman driving a French car. Hilleret drove an 80-horsepower Lorraine-Dietrich, which it is claimed formerly was owned by Gabriel. Hilleret's time was :24⅘, not bad for a slow track. There were twenty-five cars and six motor cycles which started. Among the cars was one American, a Ford, which however was defeated by a Mercedes and a de Dion-Bouton, the former winning in :46⅕, the French car's time being :46⅘, while the American machine was 1⅘ seconds slower. Besides the Mercedes, the class winners were two Fiats, an Isotta-Fraschini, a Demeester, a Gregoire and a Sizaire-Naudin. Humber and Peugeot were the motor cycle winning machines. For 1910 preparations are being made to hold a series of international motor races, for which several wealthy Argentina sportsmen have pledged already $30,000 for cash prizes. A road race, a kilometer and a flying and standing start mile speed trials, a 1-hour race and minor events are to be contested. Famous European drivers have been approached and offered big bonuses to come and several French and Italian pilots are said to have signed contracts.

PARK ROAD RACE PROFITS

Philadelphia, Pa., Dec. 6—As a result of the generosity of the Quaker City Motor Club in waiving any share of the profits of the Fairmount park road race, the four charities that were beneficiaries of the race will get $7,617.34. The total receipts were $11,735.41. This included, in addition to the sale of seats and parking places, the returns from the official program, one-half of whose advertising receipts were donated by the club to the cause; receipts from voluntary contributions placed in globes by the spectators, some outside contributions and income from other sources. The main item of expense was the erection of the stand. The gross expenses were $4,118.07. There is no doubt now but what this race has become a fixture and that it will be greater than ever in 1910 which will be the third renewal of the classic.

SCIENTIFIC STUDY OF ROAD CONDITIONS

WITH the great development of mechanical locomotion there has been again given to the roads that degree of importance as means of communication of which the railroads had to a large extent deprived them. Once more the main lines of traffic are literally filled by the numerous vehicles that use them, from the humble bicycle up to the enormous motor truck, and the result is that they are generally very much overcrowded. Frequent complaints from users of the road are heard regarding the regulations for taking curves; usually that they are poorly observed, but sometimes even regarding the rules themselves. Discussion already has been set afoot and the question has been raised whether the rules of the road would not be improved by compelling drivers to take, not the right, but the left hand, as is done in England and Austria. This discussion is not without its interest, but it appears to the writer that what should first be studied is the question of adapting the roads to the new requirements.

The crowding arises not so much from the number of vehicles on the road as from the difference in their speeds. When there was nothing but horse-drawn vehicles on the road it was always an easy matter to pass the vehicle that was ahead. But now! Between the heavy truck drawn by four or five horses, and the 40-horsepower touring car, there is a world entire. There are not simply two speeds, those of the horse walking and trotting, but ten, even twenty. And if there be added to this the great number of vehicles crossing the road and following one another, together with the ill humor of the horse driver, it will not be difficult to understand that circulation on the roads is far from easy. It should be possible, however, to remedy this state of affairs, and the remarkable thing is that it has not already been done.

Study of Road Conditions

Among the mass of reports recently received from the international road congress is found an interesting study that certainly should not be relegated to oblivion. Its authors, MM. Druart and Langlet, of Rheims, France, have essayed to determine a rational transverse profile for French roads in order to facilitate the taking of curves by vehicles running at different speeds. On straightway stretches the problem is naturally far less complex, for, as the road ahead can be seen, the dangers are far less numerous. Beside, the authors are of the opinion that there exists no necessity for a change in French roads in this respect. Straight roads now have the normal amount of camber required by their length, breadth and the nature of the materials employed; but things are not the same on the curves.

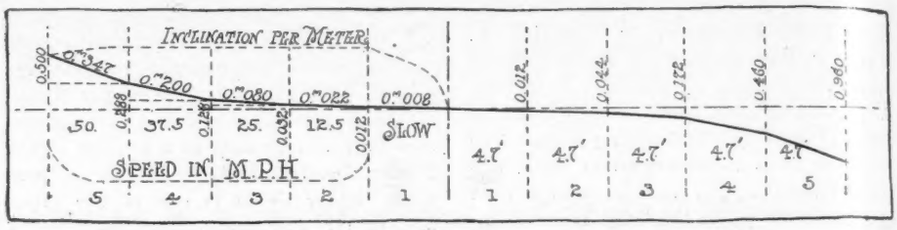


FIG. 1

Naturally, while motorists would like to have the curves banked to a degree to suit their wants, drivers of horse vehicles, on the contrary, demand that the road be left flat, and also that it have the minimum amount of camber. On the other hand, motor trucks likewise require a road without too sharp a camber. The question then is how to reconcile these directly opposed interests.

Following Predetermined Curve

This, in brief, is the principal object of the authors in question, and their proposal is not lacking in originality. In place of giving the road a uniform camber at curves they have modified the transverse profile in such a manner as to permit of pleasure cars taking the turn at speed, while slow-moving motor trucks and vehicles drawn by animal traction have a road surface, that, if not altogether flat, at least will have but a very slight elevation. In order to achieve this result the profile of the center of the road is not disturbed, while one side is elevated and the other depressed, following the outline of a predetermined curve. In fact, the project not only takes into account the radius of the curves, but also the intensity of the circulation of vehicles of different speeds at that point, so that the center of the road, which remains practically unaffected by the change of profile, may be devoted to vehicles at low speeds, while the two outer parts that are graded, the inclination being accentuated in proportion as the superelevation or depression recedes from the median line, are reserved for the higher speeds.

Example Is Given

Suppose, however, that among these vehicles there are some running at 20 kilometres per hour—12 miles—while others attain to 40, 60 or 80 kilometres—24, 36 or 48 miles—should the road be constructed so as to present one, two, three or four different inclinations? The authors in question hold an affirmative opinion. To them this is the chief original feature of their project, that of so modifying the profile that the curve may be taken without slowing down, provided there be no obstructions.

The grade to be given can be calculated by the formula $S = \frac{0.012V^2}{R}$ adopted by railroad engineers, and in which

S = Superelevation
V = speed in kilometres
R = radius of the curve in metres.

For example, the problem is to trace the profile of a curve, whether right or left hand, of 150 metres—495 feet—radius. If there circulate on this road an equal number of vehicles of different classes the profile would be represented by Figs. 1 and 3, herewith. But these profiles show on each half of the surface five sections 1.44 metres—4.7 feet—wide, and of different grades, which gives a total width of 1.44x10 = 14.40 metres—47.5 feet. But this must be reduced, as, unfortunately,

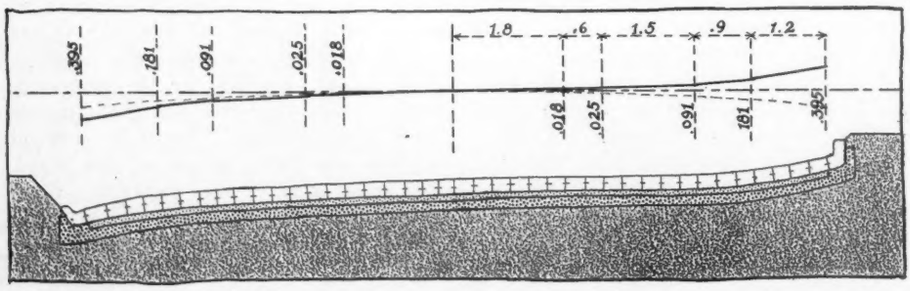


FIG. 4

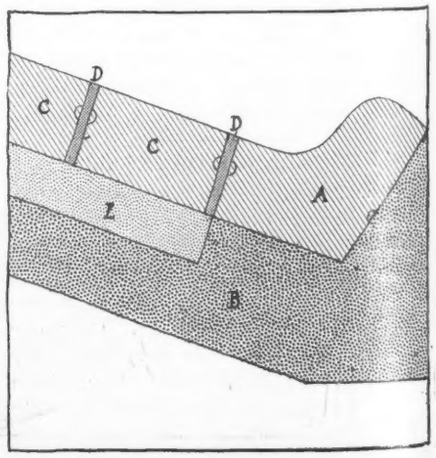


FIG. 5

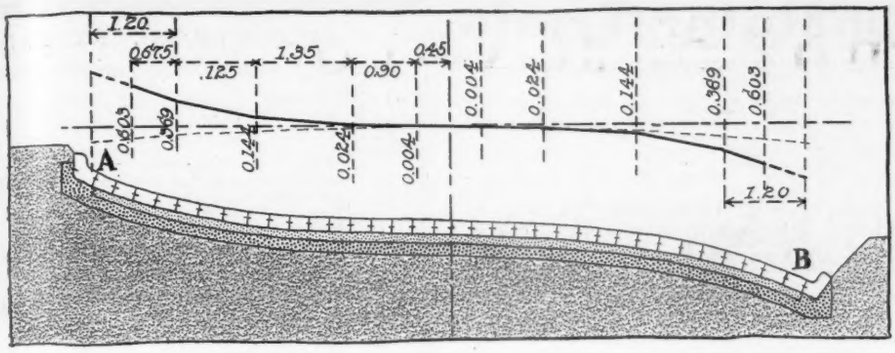


FIG. 2

French roads are not as wide as this. For instance, if we have to calculate the profile of a road 9 metres—29.25 feet—wide, each section will have a width of $\frac{9}{14.40} \times 1.44 = 0.90$. The reduction will thus be very easy. However, in the definitive profile Figs. 2 and 4, it will be noted that the road bed, in place of being divided into 10 sections of 0.90 metre—12.95 feet—each, is divided into unequal parts of 0.45, 0.90, 1.35, 1.25 and 1.20 metres wide.

Different Speeds Used

This is because the authors have taken into account the fact that there will be a varying proportion among the vehicles of different speeds that use the roads. Here, for illustration, are the percentages they have fixed upon.

Per cent.

10 = very slow speed
20 = 20 kilometers—12.5 miles—per hour
30 = 40 kilometers—25 miles—per hour
25 = 60 kilometers—37.5 miles—per hour
15 = 80 kilometers—50 miles—per hour

And the width of the sections corresponding to the different speeds of the vehicles have been based upon these predetermined percentages, the very slow amounting to 10 per cent of the total width, the next to 20 per cent, and so on.

Naturally, these modifications are capable of infinite variation. They may even be varied in the same district by following such and such a route. The periodical French census of vehicles would give the exact proportion of the first, second and third class, etc., and the profile could be established on this basis. Then, according to the Langlet-Druart system, high speed vehicles would be confined to the outer extremes of the road, while very slow ones would be in the center; between these two would be the medium-speed vehicles. Each half of the road being identical with the other half it cannot be said that the traffic in one direction is favored over that proceeding in the other. The right hand being reserved for vehicles traveling one direction the left may be used by those going in the opposite direction, thus eleminating the danger of collision between cars traveling in opposing directions at high speed, since the profile proposed would throw them to opposite extremes of the road. It should further be noted, particularly, that the half of the road being reserved for cars going in one direction drivers of slow-moving vehicles will not have anything to look out for except those of his own class coming from the opposite direction, and everyone knows that these are the easiest to avoid, since they may be seen.

Accidents Are Anticipated

But the authors of the project have recognized the fact that in relegating high-speed vehicles to the extremes of the road centrifugal force will tend to throw them off the roadbed, and when the wheels run off from the parts thus put in good shape for speeding dangerous accidents are to be anticipated. It would be possible, however, although the construction would be prohibitively expensive, to border the roads with curbs, such as are employed in cities. It is therefore necessary to hit upon some other expedient, and the authors propose to employ a system of paving of their own invention, which is quite ingenious. The blocks intended for the edges are so designed as to form a ridge which will prevent the wheels of a car from leaving the road, this ridge also forming a permanent border and filling the office of the curbs of city streets.

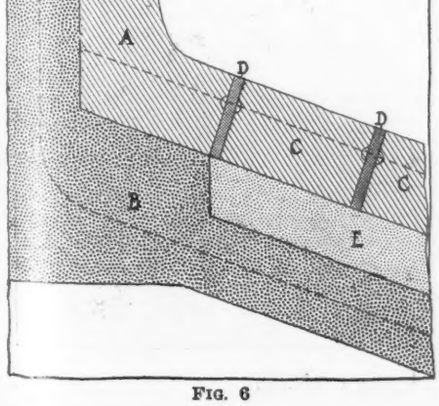


FIG. 6

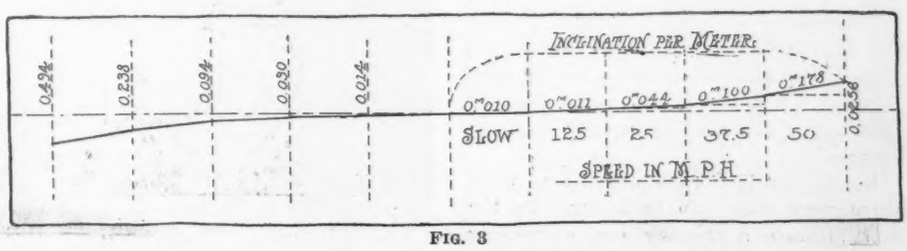


FIG. 3

It has seemed that the plan made by Langlet and Druart is worthy of being put into practical use. It is the result of close study of the problem by men who fully understand the requirements. This is not their first essay in the field of road-building, as it is now 27 years since they recommended the binding of road pavement with tar and pitch, an idea which resulted in the granting of a patent as long ago as December 30, 1881. In fact, the idea will shortly be experimented with seriously by the French government bureau of bridges and roads. It may even be said that a curve in the environs of Paris will doubtless be constructed according to the principles laid down by Langlet and Druart.

BLUE BOOK STATISTICS

Chicago, Dec. 6—An enthusiastic figurer in the office of the publishers of the Official Automobile Blue Book, recently compiled some interesting figures to present on the sales of that well-known work, for 1909. He ascertained that it required the skins of 1,950 cows to supply the leather for the 25,000 books which have been sold. He also figured that if all of these books were placed one on top of the other, it would make a column 2,833 feet high, or over four times the height of the Metropolitan Life building, the highest building in the United States. Placed lengthwise, these books would make a path 3 miles long, running from Forty-second street to Grant's tomb, New York. The Blue Book company says: "These figures show the interest which has been taken in touring in the past year, and it is estimated that they will be doubled during 1910. The amount of touring which will take place next year will be enormous. The cars being purchased have greater reliability than those of the past, and the increasing enthusiasm for country traveling will bring about, it is expected, a constant procession of cars on the country road next summer. That the hotels and garages all over the country anticipate this is evidenced by the number of new enterprises of this character which are stretching out. Many of the hotels which cater to the wants of the motorist are making additions to their buildings and many garages with up-to-date equipments are being built."

The publishers of the Blue Book in preparation for the big demand which the work will receive next year, intend to make the book the most complete road guide ever issued.

Austria's Industrial Motor Trials

IN THIS year's Austrian commercial and industrial vehicle trials, which were held October 3 to 17, the German-made Bussing and the Austrian-built Daimler vehicles took the highest awards. The trials were the severest ever promoted in this country, the cars being on the roads during 12 days, during which time some of them had to run a total distance of 707.8 miles and others were scheduled to go 1,020 miles. The routes were such as to allow the cars to be tried out for level work as well as hill-climbing efficiency. The most remarkable feature of the whole trials is that every one of the fourteen cars which left Vienna came back to the starting place. This is without precedent.

There were seven classes of vehicles. The first one was for cars having one or more trailers and had as starters the six-cylinder 70-horsepower Austrian Daimler, with three trailers, a 30-horsepower Austrian Daimler with one trailer, a 38-horsepower Bussing with one trailer and two 35-horsepower Mulags, each having one trailer. In class 2, for trucks carrying a load of over 8,800 pounds, the starters were a 38-horsepower Bussing and a 35-40-horsepower Berna. There was only one starter, a 24-horsepower Mulag in class 3, for trucks carrying a load of from 5,500 to 7,700 pounds. In class 4, for light trucks carrying a load of from 3,300 to 4,400 pounds, the starters were a 20-horsepower Austrian Daimler, an 18-24-horsepower Austrian Fiat and a 30-horsepower Bussing. Class 5 was for delivery cars carrying a load of from 1,100 to 2,200 pounds and the only entrant and starter was a 14-16-horsepower Austrian Fiat. A 30-horsepower Bussing started in class 6 for omnibuses carrying eight to fourteen passengers, while the sole starter in class 7, for buses carrying more than fourteen passengers, was a 30-horsepower Austrian Daimler.

During the 12 days of actual road work there were only two accidents. In the first instance a steering post connecting stem broke on one car through a flaw in the material. The vehicle continued to be operated by the driver for a distance of over 45 miles before—so it is claimed—the driver noticed that there was anything wrong. The second mishap was caused when a bearing dropped out, owing to the carelessness of the driver in over-lubricating. None of the cars was actually laid up on account of mechanical defects or troubles. One of the principal reasons why all the cars finished the trials, is, according to military and other experts, due to the fact that all had rubber tires. Even the heavy trucks with their load of from 5 to 12 tons had rubber-shod wheels, and from all appearance the cars came through in excellent condition.

BUSSING TRUCK IN AUSTRIAN INDUSTRIAL TRIALS

The German Bussing probably scored best in the trials, although the Austrian Daimler took two of the big prizes. The 10-ton Bussing truck with trailer was awarded the trophy of the secretary of public works for having gone through the entire trials in maintaining daily the best average speed near to the prescribed speed, and having the best average in the consumption test. The same vehicle received the gold medal of the Austrian Automobile Club for having made the best showing throughout the trials and making no involuntary stops. The cups given by the secretary of commerce and from the secretary of internal affairs were won by the 30-horsepower Bussing omnibus for having made the best daily average speed record nearest to the minimum allowed and for having shown up best at the same time in the consumption test. The 70-horsepower Daimler with its three trailers took the secretary of war's trophy which was to go to the truck with one, two or three trailers carrying a load of 8,800, 13,200, 17,600 pounds or more, making the best daily speed average and showed the least pressure upon the axles. The second prize of the war department went to the 20-horsepower Daimler truck, which, besides making the best speed average daily, carrying a load of at least 3,300 pounds, showed the least pressure upon the rear axle.

The Bussing vehicles are built to use either light or heavy-grade gasoline. The motor, however, will permit the consumption of benzol or Borneo naptha without it being necessary to change the carbureter. The four cylinder motor turns at 900 revolutions. There is a regulator which prevents the motor going any faster than 900 revolutions, this being to prevent the driver from going at excess speed. All the valves and the ignition are located on the cylinder head. The crankcase is very light, the entire construction being made with a view of getting the strongest parts and having them at the same time as light as consistent. The various parts may all be disassembled very easily. The carbureter, for instance, can be taken out by removing just two small nuts which

RECORD OF THE CARS IN THE

Class in which Entered	Cars	Cyl. and H. P.		Load Carried in Tons
1	Austrian-Daimler, 3 trailers.	6	70	12
1	Austrian-Daimler, 1 trailer..	4	30	8
1	Bussing, 1 trailer.....	4	38	10
1	Mulag, 1 trailer.....	4	35	7.5
1	Mulag, 1 trailer	4	35	5
2	Bussing.....	4	38	5
2	Berna.....	4	35-40	5
3	Mulag	4	24	2.5
4	Austrian-Daimler.....	4	20	1.5
4	Austrian-Fiat.....	4	18-24	1.5
4	Bussing	4	30	2
5	Austrian-Fiat.....	4	14-16	3
6	Austrian-Daimler	4	30	2
7	Bussing.....	4	30	1.4

AUSTRIAN DAIMLER TRAIN AND A TRAILER

AUSTRIA INDUSTRIAL TRIALS

Actual Running Time		Average Speed Specified	Average Speed Maintained	Ton Mileage	Distance Covered in Miles	Gas. consumed per ton mile	Total Distance Covered
106	41	4.1	6.3	1231	102.6	3.31	707.8
99	32	4.1	7.8	850	102.6	.294	707.8
90	33	5.3	8.1	1041	102.6	.176	707.8
85	32	5.3	9.15	804	102.6	.177	707.8
75	43	5.95	10.7	515.6	102.6	.344	707.8
75	18	5.95	10.21	515.6	102.6	.288	707.8
81	06	5.95	9.04	515.6	102.6	.203	707.8
56	07	8.13	12.9	257.7	102.6	.379	707.8
78	20	9.95	13.55	253	168	.585	1020
79	07	9.95	12.75	253	168	.608	1020
78	21	9.33	13.76	337	168	.440	1020
59	35	11.2	17.61	52.5	168	.0129	1020
83	55	9.33	12.6	337	168	.880	1020
73	24	9.95	14.16	236	168	.627	1020

hold it. The ignition is by low-tension magneto. The cooling is by water and the waterjackets are detachable. The six-cylinder 70 horsepower Daimler may develop 90 horsepower. The steering valves are double opposed. The ignition is by make-and-break and high-tension in connection with plugs. Cooling is done by a chain and sprocket pump which serves each pair of cylinders separately.

The light Daimler truck is built to carry a load of from 3,300 to 4,400 pounds. The transmission is by chain. Ignition is of the make-and-break type. Cooling is by centrifugal pump and the radiator is of the honeycomb type. There are four speeds, the highest one being direct. When the car has its normal load it is able to average 16¾ miles an hour on level roads.

DEATH OF ALDEN SAMPSON

Alden Sampson, 2nd, who made commercial trucks bearing his name at Pittsfield, Mass., died at his home there last Friday after a short illness. Mr. Sampson had been abroad and was present at the army manouvers in France November 19 when various commercial vehicles were tried out watching the progress being made there. A few days ago he visited Boston to complete arrangements for several trucks that had been ordered, when he caught cold. This developed into pneumonia and it carried him off in 9 days. The Sampson truck has become a big factor in the commercial motor world. Mr. Sampson had devoted all his time and energy in making it such.

In the Realm of the Commercial Car

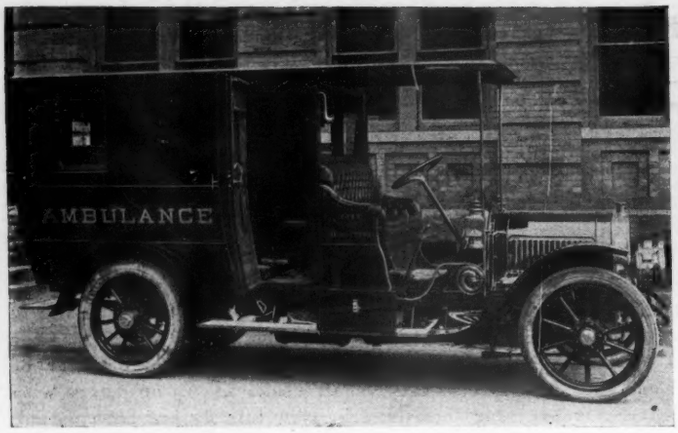
CHICAGO has set out to handle the taxicab proposition in a business-like manner. First it has probed intelligently into the question of rates; then it has recognized the necessity of setting aside certain portions of the business streets for taxicab stands and lastly it has determined to curb the reckless chauffeur by the most effective means—through his pocketbook. By compelling a driver of a public motor vehicle to put up a bond before he can be licensed and then hold suspension of the license over his head for violations of the code, it is thought the chauffeur can be tamed and made a responsible member of the community. Also the city council is taking steps to stop the squabbling between driver and passenger over the collection of the fare. The need of such legislation has been brought out by the differences of opinion between chauffeur and fare as to whether or not the cab is hired on a mileage or time basis. Now there is pending an amendment to the ordinance which fixes the fee at $5 an hour for four persons and $4 an hour for one or two. It also has been suggested that each chauffeur be compelled to supply an order blank which the passenger could sign and at the same time designate whether the contract was on time or mileage. This, however, applies only to public motor vehicles other than taxicabs, for another clause, regulating the rates, specifies that no machine fitted with a taximeter may be rented on a time basis. This is to prevent a fight over rates, the new tariff specifying 40 cents for the first ½ mile and 10 cents for each ¼ mile thereafter for four or more persons. A fee of $1.50 an hour is fixed for waiting time at stops.

When things get regulated in the Windy City, Chicago probably will have the honor of first licensing the operator of public motor vehicles. An ordinance with this end in view already has been passed, but it does not go into effect until February, 1910. In the legal phraseology of the measure "on and after the first day of February, 1910, no motor vehicle engaged in the transportation of passengers, merchandise, or any other purpose for hire or reward shall be propelled or driven upon or along any street, alley or other public way in the city unless the person in charge of such vehicle and who is acting as the operator thereof, and as such operator controls the means of propulsion of any such vehicle, shall be a person duly examined in the manner hereinafter provided and found competent and qualified to operate or drive such vehicle through the city streets without endangering the public safety and duly licensed as provided for herein."

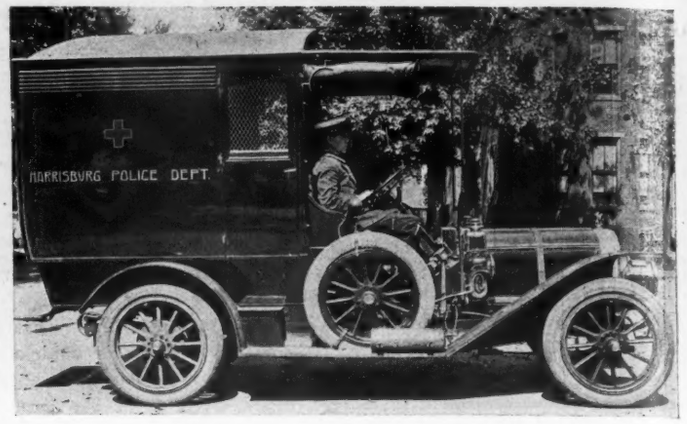
SEVENTY-HORSEPOWER AUSTRIAN DAIMLER AND THREE TRAILERS

The ordinance then defines the meaning of motor vehicle and announces that the board of examiners shall consist of the city electrician, commissioner of health and the city engineer, who shall act, ex-officio, with the city electrician chairman of the board. The examinations will not be oftener than on 2 days a month. Each applicant must show that he is duly qualified for service in the way of health, experience, knowledge of the city and the laws of the state. The applicant must be endorsed by at least two responsible citizens of the city, who must certify that he is a man of good habits, honest, sober, industrious and a fit person to drive a public motor vehicle. There is a fee of $3 demanded and in addition the chauffeur

THE 35-HORSEPOWER MULAG AND ITS TRAILER



POPE-HARTFORD'S LATEST AMBULANCE IDEA



RAMBLER PATROL AND AMBULANCE AT HARRISBURG, PA.

must file a bond of $200, with sureties to be approved by the city collector or city clerk, this bond to be filed with the city comptroller. A renewal of the license, which must be made annually, will cost $2. In the event of a license being renewed, or reissued, if once revoked, a new examination for the purpose of ascertaining the licensee's physical qualifications must be taken in the same manner as provided for in cases of original examinations. Each public chauffeur must carry a metal badge which must be worn in a conspicuous place.

Intelligent thought is displayed in the framing up of that section of the ordinance referring to the duties of an operator, chief of which is a clause relating to his conduct in the case of accidents. It says, "it shall be the duty of every operator first to report in writing to the superintendent of police upon blanks to be provided by the police department all injuries—whether to persons or property—accidents or casualties in which the vehicle driven by him participated incidentally, directly or indirectly, within 12 hours of the happening thereof, in detail, the time, nature and cause of the injury, accident or casualty; a description of the thing injured, or the name and address of the person injured or killed, together with the name, address and license number of the operator submitting such report. Physical inability alone shall constitute excuse for non-compliance with the foregoing provision." The operator always must carry his license papers and he must notify the board of a change in address, giving the new address in full. There are six acts that are prohibited, as follows:

First—Drive or propel a motor vehicle upon or along any street or other public way in the city without first having obtained a certificate and license as hereinbefore provided.

Second—Operate any type or class of motor vehicle except the type or class of vehicles specified in his certificate and license.

Third—Operate or attempt to operate any such vehicle while intoxicated.

Fourth—Operate a motor vehicle from a street stand unless such vehicle is duly licensed.

Fifth—Demand a higher rate of fare than specified by the ordinances of the city.

Sixth—Permit another to wear his badge or carry his license for the purpose of holding himself out as a licensed operator.

Some criticism is made of the second clause, which it is felt would work a hardship on a garage which maintained steam, gasoline and electric vehicles, for the operator of a steamer could not drive a gasoline car even if he was competent.

Any operator licensed under the provisions of the ordinance who shall be fined for a violation of the state law or a breach of the city measure may have his license suspended by the mayor upon the recommendation of the board or superintendent of police for a period not to exceed 60 days or revoked at the discretion of the mayor. If the license is revoked no further license shall be granted for a period of 1 year.

There is another ordinance establishing stands in the downtown district. Twenty-five of these have been established at convenient places and further it is provided that public motor vehicles may stand "at all theater and other public places of amusement 15 minutes before the conclusion of the performance given therein, provided there be no public stand established within 200 feet of the entrance thereof; at all railroad depots and public boat landings, provided there be no public cab and hack stand established within 200 feet of the main entrance to such depot or public boat landing; on all streets, except State street, between the hours of 6:30 p. m. and 6:30 a. m. each night, provided that no cab, hack or other vehicle shall be permitted to stand anywhere thereon in such manner as to obstruct any crossing, or entrance to any building, structure, or place. No cab, hack, or other vehicle entitled to use such stands shall be permitted to stand anywhere thereon in such manner as to obstruct any crossing or the entrance to any building or place."

MASSACHUSETTS WEIGHTS & MEASURES DEPARTMENT 1/4 MILE
MASSACHUSETTS WEIGHTS & MEASURES DEPARTMENT 2/3 MILE
MASSACHUSETTS WEIGHTS & MEASURES DEPARTMENT 1/3 MILE
MASSACHUSETTS WEIGHTS & MEASURES DEPARTMENT 3/4 MILE
MASSACHUSETTS WEIGHTS & MEASURES DEPARTMENT 1/2 MILE
MASSACHUSETTS WEIGHTS & MEASURES DEPARTMENT 1 MILE

BOSTON TAXIMETER TEST MARKS

INSPECTING TAXIMETERS

The first step toward really inspecting and sealing taximeters in this country has been taken by Daniel Palmer, commissioner of weights and measures for Massachusetts, who has just had a series of plates set in position in Boston. These plates are located on Beacon street between Charles street and Massachusetts avenue, Commonwealth avenue between Arlington street and Massachusetts avenue, and Columbus avenue between Dartmouth and Regent streets. Each course is 1 mile long and it has been subdivided into varying lengths such as ⅓, ¼, ½, ¾ and 1 miles. In the testing of meters it is planned to run a taxicab over one of these courses and note the working and accuracy of the motor in actual use by the tariff recorded for the various distances traveled. A cab will be brought to a position opposite the plate marked "start." As the cab is put in motion the flag is thrown to the first tariff position, which will indicate 30 cents, this being the initial charge for the first ½-mile or fraction thereof. If the meter is correct it will record an additional 10 cents when the ½-mile plate is passed, and an additional charge of 10 cents being automatically registered for each ¼-mile traveled thereafter. The method of testing the second tariff will be the same, with the exception that the initial charge will be 30 cents for

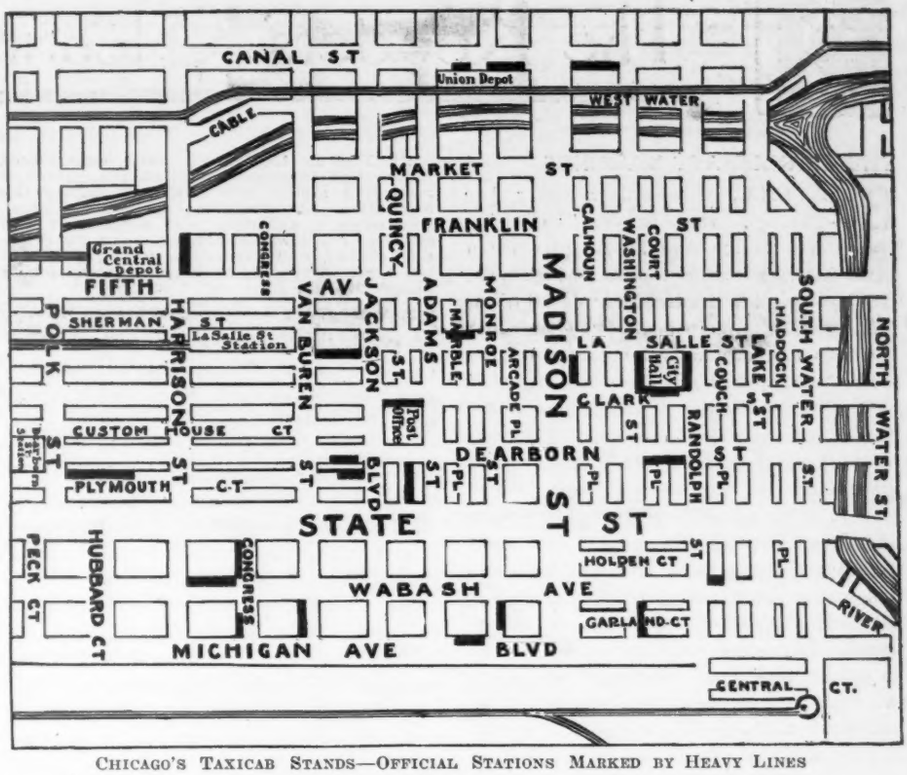
the first ⅛-mile or fraction thereof and an additional 10 cents for each subsequent ⅛ of a mile. It will also be necessary to test the accuracy of the clock mechanism which registers the charge for waiting time. Some of the meters in use in Massachusetts make a waiting charge of 10 cents for the first 12 minutes and 10 cents for each additional 6 minutes, while other meters make a charge of 10 cents for each 6 minutes of waiting. As this amount is paid by the patrons in addition to the mileage charges, it is essential that the clock mechanism should register correctly, and this part of the meter will be compared with standard chronometers.

If after testing all parts of the meter it is found to be correct, the inspector will seal the same, the sealing being performed by placing a lead seal suitably marked on the meter in such a manner that the meter head cannot be detached or removed from the cab without breaking the seal. A card will also be placed in each cab certifying that the meter in use on that cab has been sealed. Meters which are found to be inaccurate will be condemned for further use, or until they have been made to register accurately.

The law empowers the commissioner to make rules and regulations as he may deem necessary to insure accuracy in taximeters, and he has already ruled that the flexible shaft operating the motor shall be attached to the front wheel in all instances. It has been shown that attaching this mechanism to the rear wheel often results in overcharge to the customer, due to the slipping of the wheel. On some of the cabs in use in Boston the mechanism is attached to the rear wheels.

RAMBLER AMBULANCE

The Rambler patrol and ambulance that the city of Harrisburg, Pa., purchased to take the place of the horse-drawn vehicle, is now in daily service. Thomas B. Jeffery & Co. built this car especially for the city of Harrisburg, putting on a larger frame than regular, heavier axles, heavier springs and larger wheels and hubs. The car is a four-cylinder 45-horsepower model with 123-inch wheelbase and 35 by 5 inch tires. It is equipped with an offset crankshaft and straight line drive, and in it are embodied all the 1910 Rambler features. The interior is so arranged that it is possible to accommodate four injured people at one time, as well as several attendants. The equipment consists of three stretchers, two of which are for ordinary work and one stair stretcher which can be used in carrying a patient around a winding stairs without any danger of jarring.



CHICAGO'S TAXICAB STANDS—OFFICIAL STATIONS MARKED BY HEAVY LINES

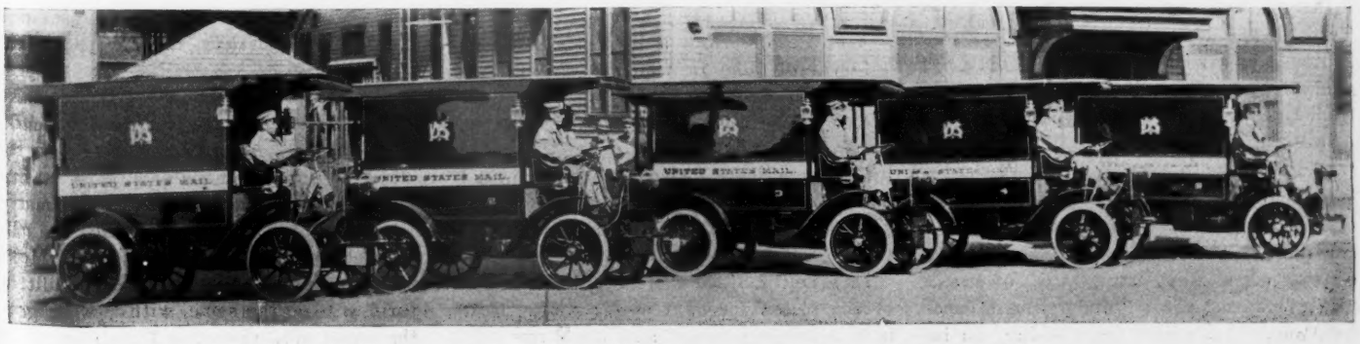
NEW POPE WAGON

The Pope Mfg. Co. has just shipped a combination chemical and hose wagon to the San Francisco fire department. This is the largest that the company has ever built and is constructed somewhat differently from past models. The wheelbase is 130 inches and the parts from which the car was built are for the most part of the model T. The body is 138 inches over all, and there is ample room for storage of 1,000 feet of regulation 2½-inch fire hose, and there are two 35-gallon chemical tanks and 250 feet of chemical hose as well as other accessories required by a verdict of this description. Similar cars are being constructed for the Manchester and Middletown, Conn., departments.

The Pope-Hartford motor ambulance has a wheelbase of 130 inches, a tread of 56 inches, wheels 34 inches, tires 5 inches, a 40-horsepower four-cylinder engine, with selective transmission, three speeds forward and reverse, shaft driven and two sets of brakes. The inside floor space is 38 by 90 inches and the inside height 58 inches. There are doors on each side and double end doors. Four beds, four stretchers, pillows, medicine chest, inside folding seats for surgeons are supplied. The machine is fully lighted outside and inside and has speaking tube, gong, horn and full set of tools.

UNCLE SAM BUYS AUTOCARS

The Autocar Co., of Ardmore, Pa., has just delivered five trucks to the Philadelphia postoffice for use in the collection of packages and mail in northern and northeastern sections of Philadelphia. These trucks started in operation on October 1 and replaced ten of the old-style horse-drawn vehicles. The truck consists of one of the Autocar commercial chassis, upon which is mounted a body built to the specifications of the United States government.



AUTOCAR COMMERCIAL WAGONS DESIGNED FOR USE OF PHILADELPHIA POSTOFFICE

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

THE CRANKSHAFT BEARINGS

BOONVILLE, MO.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly give me a little information on the following: In looking over the different car descriptions I find some use plain bearings, some roller bearings and others ball bearings on the crankshaft. What are the advantages of each kind, and which bearing does Motor Age consider the best?—Fred Sombart.

Ball bearings are at present used on the crankshafts of not a few cars. Some makers have adopted them because they offer less friction; others have used them because you can have a shorter bearing and so, by use of a larger diameter crankshaft, the length of the motor can be reduced. In motors with the cylinders cast en bloc two ball bearings are used in several instances, the advantage of which is that should the shaft spring slightly midway of the bearings this does not materially affect or increase the friction, as the support in the ball bearings is simply a ring of points. Where a plain bearing is used in such design this bearing, owing to it being from 3 to 6 inches long, there is a chance for stresses being created. The great majority of cars use plain bearings for the crankshaft. These bearings are in greater favor in American cars than are other types. Roller bearings have not been used much on crankshafts, the Haynes company being one of the few to make use of them. As to which type is the best depends largely on the construction and proportioning of the bearing to the load it has to carry. Ball bearings are at present giving success on some makes of cars, whereas other makers, after using them for several seasons, have discontinued them. With ball bearings, owing to the short surface on which the entire load is carried, the crankshaft must be made stronger. With the annular ball bearings there is no possibility of adjusting the bearing. In plain bearings shims are inserted which permit of adjustment.

SMALL GARAGE EQUIPMENT

San Antonio, Tex.—Editor Motor Age—Through the Readers' Clearing House will Motor Age give me some idea as to the equipment for a small garage and cost of same? I desire one equipped for repairs of all kinds and with vulcanizing plant. I would also like to know the regular storing rates.—J. A. C.

The equipment for a small garage, fitted for all kinds of ordinary repairs, would consist of a wash rack with overhead water connections; an underground gasoline tank from which the gasoline can be pumped when needed; and several lubricating oil tanks with pumps so that several grades of oil could be carried in stock; some office fixtures and a couple of show cases might also be necessary; the machine shop should contain a large and a small lathe, a planer, a milling machine for cutting gears, a large and small drill press, a grinder, a forge, a welding or brazing outfit perhaps, an air compressor and a storage tank with piping for distribution about the shop and garage; a 5-horsepower electric motor, or a gasoline engine would furnish the power to operate these machines; if an electric motor is used and runs on an alternating current a rectifier would be necessary for transforming the alternating current supplied from the mains to a direct current for charging storage batteries; a complete set of tools, work benches, vices, etc., and the vulcanizing outfit would probably complete the equipment.

HORSEPOWER AND CYCLES

Cambridge City, Ind.—Editor Motor Age—Through the Readers' Clearing House will Motor Age give an explanation of the A. L. A. M. horsepower rating. Also explain what is meant by cycle on two and four-cylinder motors.—Arthur Reese.

The A. L. A. M. formula is written as follows:

$$\text{H. P.} = \frac{D^2 N}{2.5}$$

When

H. P. = Reasonable expectation of power of the motor as actually delivered.

D^2 = Square of bore of cylinder in inches.

N = Number of cylinders.

The above formula is based on a piston travel of 1,000 feet per minute, so that the speed is taken into account; the speed of the motor must be that which will make the piston travel 1,000 feet per minute.

Webster describes a cycle as being an interval of time in which a certain succession of events or phenomena is completed, and then returns again and again, uniformly and continually in the same order; a periodical space of time marked by the recurrence of something peculiar, as the cycle of the seasons, or of the year.

In a motor, since there are four strokes of the piston for each power stroke, if it is a four-cycle motor, and since the phenomena is recurring, the definition, as given in Webster, repeated above, is apropos. It will be understood that, in a two-cycle motor, there is a power stroke for each two strokes of the piston; in each case, as above set down, reference is had to a single cylinder; if there are a plurality of cylinders, the cyclic relation will be repeated in each cylinder, but there will be a lag between them. In a four-cycle motor the four cycles are: Suction, compression, explosion and exhaust. During suction the piston, by displacement, draws in a new charge; during the compression, by displacement again, the piston compresses the charge; during explosion the energy residing in the fuel is imparted to the piston, forcing it down; and during exhaust, by displacement, the piston scavenges the cylinder and the new cycle then begins by the next suction stroke, which sucks in a new charge.

USING A CLOSED MUFFLER

Aneta, N. Dak.—Editor Motor Age—Through the Readers' Clearing House will Motor Age inform me if it will harm the engine on a two-cylinder Buick, model F, to run it with the muffler closed, and how?—F. P. Lippert.

It is understood by running with the muffler closed that you mean plugging up the exit pipe from it to the atmosphere. This would work an injury in that the gases not being liberated would create back pressure on the cylinders and reduce the power of the motor. It would soon become impossible to run the motor. There would be no special harm to the motor other than that it would not run. On the other hand, if you mean running with the muffler cutout closed, there will not be any harm done to the motor, but the power will be less than with the cutout open.

REDUCING CAR WEIGHT

Le Mars, Ia.—Editor Motor Age—In Motor Age, November 25 issue, in these columns appeared an article entitled "Wants Weight to Load Ratio," which makes very interesting reading. If the writer of this article will refer back to copies of Motor Age of about 1 year ago he will find the editor called for ideal specifications of cars from its readers; that is, what each considered would make his ideal car, if he were having it made to order. As I read each one of these carefully I do not remember of anyone calling for a lighter car than 2,500 pounds, many as high as 3,500, and some ignored the all-important weight question entirely. Most everyone wanted 30 to 45-horsepower, little thinking the extra weight they were getting would give them but little more abil-

ity to get up a bad hill or through deep mud than the lighter car they had. All admit tire trouble and blame tire makers for poor tires, etc., not considering for one moment the awful load tires are called upon to carry. That Motor Age readers are a representative lot of men must certainly be admitted. Then why do we blame the makers for giving us what fully 90 per cent have called for. A reform wave is sweeping the country and some of the old makers who never thought of such a thing as making any mention of how light their car was, are now doing this; and certain makers of light, powerful cars, along modern methods, who are among the leading advertisers in Motor Age, have found their eastern factories unable to supply the demand and been forced to open up a large western factory. Let S. and every reader who believes in light weight and larger wheels make his wants known and be willing to pay a fair price for a car that is built on the whalebone principle and inside of a year the evil effects of the cheap cast iron cars selling near the $500 mark will be entirely forgotten. —C. L. VonBerg.

CLUTCH IN TURNING CORNERS

Tulsa, Okla.—Editor Motor Age—I recently had an argument as to which was the better way to turn a corner with a motor car, and would like Motor Age to settle the matter. The subject of the argument was whether or not the clutch should be released while turning a corner in high gear and at a moderate rate of speed.—C. E. McCullow.

To release the clutch while turning would be beneficial inasmuch as it would relieve the differential gearing and the tires of the driving strain, and the slipping of the clutch in letting it in again would relieve the motor of much of the strain of picking up speed on the high gear. In general driving it is not customary to release the clutch turning corners unless to reduce speed, at which time the brakes are applied and throttle closed.

TORSION AND RADIUS RODS

Chicago—Editor Motor Age—Will Motor Age kindly explain the proper use of torsion and radius rods.—Tennant Motor, Ltd.

The radius rod generally extends from the rear axle housing forward to some part of the side members of the frame. These rods are used to transmit the forward drive of the rear axle to the frame. In some cars radius rods push the car from the rear axle through the springs. In other cars, the car is pushed through the torsion tube, which incloses the driveshaft and attaches at the forward end through a ball-and-socket, or yoke coupling to a cross member of the frame. The torsion tube, on the other hand, is to prevent a rotating movement of the rear axle. When the bevel pinion on the rear end of the propellorshaft delivers its power to the differential gear it would naturally start the axle housing rotating, if this were not resisted, and it is to do this that the torsion rod is furnished. In some cars the torsion and radius rods are one, taking the form of a tube enclosing the propellorshaft and the tube attaching at its forward end to a frame crosspiece.

USE OF AMORPHOUS GRAPHITE

Dallas City, Ill.—Editor Motor Age—Through these columns will Motor Age advise me whether or not it is considered good practice to sprinkle powdered or amorphous graphite on the wearing surfaces of bevel gears and transmission gears for the purpose of polishing same and filling microscopical indentions in the gears. Also, is it considered good practice to mix graphite in with other lubricants for transmission or bevel gear lubrication. If so, will Motor Age kindly give me a good formula for such a mixture? What can I do to reduce the noise of the gears in order to make the car run absolutely noiseless. There is a certain kind of hum which seems to be in transmissions which I should like to eradicate if possible. The car I have in mind is equipped with Timken rear axles, with pressed steel housing and Cotta transmission.—Reader.

Yes. It is considered good practice to sprinkle powdered graphite over the gears of the transmission and rear-axle, as it is an excellent lubricant. A handful or two added to the grease or oil of the gear cases has often proven beneficial, both as a lubricant and a noise reducing agent. To render gears absolutely noiseless it is necessary that they be properly fitted, perfectly adjusted and provided with ample lubrication. Mal-adjustment of the pinion gear of the rear axle, or a diminished supply of oil will cause a humming noise which disappears when these causes have been rectified. Boxwood sawdust, also known as jeweler's sawdust, mixed with the hard grease of the gear cases, has been used in a number of cases to reduce noise, and the results have been quite satisfactory in cases where the noise was due to excessive lost motion from wear. But in cases where ball bearings are present and exposed to the sawdust it is claimed to do more harm than good. Motor Age would advise the adjustment or refitting of gears in preference of the above mentioned remedy.

COST OF OPERATING BUICK

Markesan, Wis.—Editor Motor Age—In Motor Age, issue November 11, appeared the expense account of City Salesman, who is using a one-cylinder runabout. It may be of interest to the readers of Motor Age to see the expense account of a four-cylinder roadster. While City Salesman used a second-hand car and I used a new car, the two expense accounts should not be used as a comparison between one-cylinder and four-cylinder cars.

I bought a Buick, model 10 roadster, in May, 1909, and have traveled 3,196 miles this season. I have kept an accurate itemized account of all expenses, as follows:

Repairs and adjustments, not including tires	$ 2.25
Tire expense, including outer shoe, inner shoes, patches, cement, etc. The car was equipped with Michelin tires, and one extra inner tube was purchased with the original equipment, which is not included in this statement	4.87
Fuel, 181 gallons gasoline—68 test	24.31
Lubrication	8.65
Ignition, four dry cells at 35 cents each	1.40
Illumination, carbide and new tubing	2.52
Supplies and accessories, including extra tools, spark plugs, sponge, cover, robe, cutout, etc.	14.07
	$58.07

Cost per mile, .018 cents.
Average miles per gallon of gasoline, 17.6 miles.

This is my first season with a car. I have taken care of it myself and have been to no expense for storage charges, other than those when out of town, and which are not included in the above statement. From City Salesman's account of 3,140 miles travel on an expense of $282.31 it would appear his cost per mile was 9 cents instead of 9/10-cent per mile.—White Streak.

KEROSENE IN CYLINDERS

New York—Editor Motor Age—Referring to communication signed H. C. S. in Motor Age, issue November 11, in which he claims that kerosene will cause cylinders to rust, his statement is substantially correct, but his suggested remedy may be equally harmful. Pure kerosene has no chemical action on metals, but commercial kerosene, after distillation, is often treated with sulphuric acid to cut out the tar, so-called, and later is washed, sometimes with salt water, to remove the acid. Globules of diluted acid remain in the kerosene. This fact explains the rapid disintegration of ordinary tin oil cans, which of course are made of tinned iron. The diluted acid gravitates to the bottom and attacks the iron through chance pores in the tin. Electrolitic action hastens the disintegration of the iron. Many oils sold for lubricating purposes contain a large percentage of acid. Most lubricating oils, good as well as bad, are made from the by-products of crude oil distillation. Any oil or fluid supposed to be neutral in its action on metals can easily be tested as follows: A small glass-stoppered bottle is rinsed with distilled water and then with C. P. alcohol, so that it will be chemically clean. In it are placed about three each of small strips of copper and zinc, which should touch one another. The size of these strips is immaterial, but their surfaces must be cleaned with emery or other

material, so that they will be spotless. They are then washed with alcohol and preferably dried by holding over a Bunsen flame, a pair of tweezers being employed for the purpose. Enough of the oil is added to cover them and practically fill the bottle. It is then carefully stoppered and set aside for a few days. The pressure of acid will cause electrolysis, the copper will be attacked and will turn green after contaminating the oil. This test is infallible if the purity of light oils is in question. Heavy oils may be tested in the same manner indirectly. If an oil has a heavy body, considerable quantities of acid may be present, but a direct test of this nature will fail because the acid will retain its epperoidal state and each globule will be separated from the metal by a film of pure oil, preventing chemical action. To test heavy oils a pure dilutant must first be secured. Benzine, benzol or gasoline will dilute most lubricating oils. Chemically pure dilutants of this class may be purchased at any wholesale drug store, but in justice to the manufacturers of good oils the dilutants mentioned should first be tested in the manner described, and if proven to be neutral, a sufficient quantity of the heavy oil added later. Oil which is kept circulating will seldom rust or corrode metals because any acid impurities which it may contain have no chance to precipitate. Hence impure oil is only harmful when a motor remains standing idle for a considerable period. The commutator of the magneto and any bronze bearings are most likely to suffer. The insulation of the armature coils may also be affected.—H. L.

AGENTS IN SOUTHERN INDIANA

Evansville, Ind.—Editor Motor Age—In November 18 issue of Motor Age, Readers' Clearing House, appeared an article from the Reimers Motor Car Co., Louisville, Ky., entitled, "Some Left Out." For the benefit of Motor Age readers we wish to state that we are the Haynes agents for southern Indiana, as follows: Vigo county—north of Terre Haute—east and west and all south with the exception of the two counties adjoining Louisville. —Jean Auto Co.

MANY MOTOR QUESTIONS

Chicago, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions?

1—If the oil in a reservoir should get so low as to prevent the pump from forcing oil through the regular feeds and the car is run an hour or two before this is discovered, would any material damage be done? If continued would the pistons freeze and require new pistons and cylinders?

2—At a speed of 60 miles per hour would a car turn turtle if there was a blowout in any casing if rounding a moderate corner or curve? How on a straightaway?

3—How is the best way to clean celluloid in curtains?

4—It seems quite a few cars can back out of mudholes and ditches better than to pull out. Why more power in reverse?

5—Is there any way to test valve springs accurately other than by special machines used in factories? If so, how?

6—Aside from price, weight of car, piston displacement, what other methods are used for classifying cars for races, hill-climbs, etc.? What formulæ are used? Is compression space ever figured in these formulæ? What formulæ are used for economy and reliability runs?

7—Describe rotary valves; also what is meant by overlapped valves.—E. S. V.

1—Very likely; all depends upon the amount of oil that might cling to the surfaces and serve to lubricate the bearings after the pump stops working. The piston might freeze; all depends upon the fit.

2—Not necessarily; the driver would have to do something. On a straightaway the danger is far less.

3—Apply a solution of acetone; then wash in water, and when dry apply a coat of clear lacquer.

4—The gear ratio in reverse is usually more than in low speed ahead; the motor is therefore working to better advantage.

5—The strength of a valve spring may be determined by placing the spring on the platform of a pair of scales and by pressing on the other end note the effort in pounds and the distance of compression of the spring; it will then be possible to determine the pressure required per unit of compression; the pull in pounds per unit of elongation will be the same as in compression; all laws fail after the elastic limit of the material is reached.

6—There are divers methods of combining the factors mentioned by you, and in all probability the aim is to arrive at the speed of the respective cars in order to induce the actual conditions of a race or contest. In economy runs the pounds mile or ton mile basis is frequently used. Compression is probably not taken into account.

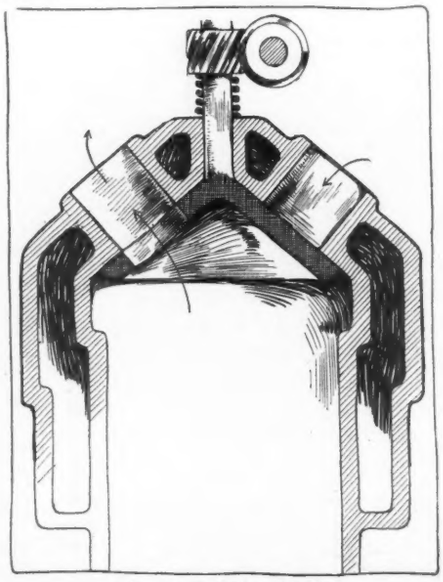


FIG. 1—ROTARY VALVE

7—A rotary valve, as the name implies, rotates; the ports are uncovered by the valve, in each case, according to a prearrangement of timing. One type of just such a valve is illustrated in Fig. 1. The valve is conical in shape, is located in the head of the cylinder, and operated through worm-gearing. As shown, one of the holes in the valve now registers with one of the cylinder ports, and said port is open. When valves are set for overlapping, the inlet and exhaust valves are open simultaneously, during a portion of the time.

BEATS REO TIRE RECORD

Rochester, N. Y.—Editor Motor Age—In reading the record of 3,692 miles made with a Reo fitted with Michelin tires in Motor Age, issue November 25, I wish to say that I can show an even better record. Our Detroit, fitted with Palmer web tires, has to its credit a mileage of 4,479 without a puncture or tire troubles of any kind. Our success is due, I believe, to keeping the tires at a pressure of 65 pounds front and 75 pounds rear.—A. G. Nagle.

FORD FUEL ECONOMY

Miller, So. Dak.—In these columns in Motor Age, issue November 25, was a Reo tire record, in which it was claimed a mileage of 3,692 was made with a Reo car without a puncture or trouble of any kind, and the writer desired to know if that stood as a record. On this subject I have to say that I have driven a model T Ford since August 1, 1909, for 6,600 miles without a puncture or tire troubles of any kind, and only pumped the tires three times during that period. I used Diamond tires and consider them good for, at least, 5,000 more miles.—R. H. Andrews.

CEMENTS CANVAS OR DUCK

Hamilton, O.—Editor Motor Age—Through the Readers' Clearing House will Motor Age give me the name of the best and strongest flexible cement to be used for cementing together canvas or duck.—Reader.

The best and strongest flexible cement for cementing together canvas or duck is a waterproof glue, know as marine glue, which may be obtained from almost any ship-chandler or dealer in shipbuilding supplies. Motor Age would be pleased to hear of a better substance from any of its readers.

THE AGRICULTURAL TRACTOR

Cincinnati, O.—Editor Motor Age—Will Motor Age advise me if there are any successful gasoline motor traction plows suitable for plowing large tracts of ground in North Dakota wheat fields, also the heavy wax lands of Fort Bend county, Texas?—D. Besuden.

One or two gasoline tractors for agricultural work have been manufactured in America. Europe has a great many tractors of this nature, many of which have been in successful operation for 5 or 6 years. The address of these, if desired, can be furnished.

Development Briefs

FIG. 1—EMPIRE DEMOUNTABLE RIM

EMPIRE DEMOUNTABLE RIM

THE Empire Tire Co. has brought out a new demountable rim in which the rim and tire complete are removed in case of puncture. Fig. 1 shows the general scheme of the rim which is held on by transverse bolts through the well felloe, there being eight of such. To remove the rim with tire it is necessary to loosen the eight nuts as illustrated in Fig. 1, not taking them entirely off. After loosening, as shown in Fig. 2, the eight lugs turn on the bolts B, thereby permitting the rim to be pulled off. The exact construction of the different devices holding the rim in place are illustrated in Fig. 3, in which the rim is shown as well as the clincher tire, which is taken off with the tire. The lug is held on by a transverse bolt with a nut which is provided with a sleeve at its inner end, which sleeve extends through the lug or clip that holds the clincher rim in place. At each point where the eight fasteners attach a right-angled metal plate is bolted to the felloe. This plate forms a step for the lug, thus holding it in a radial position while the nut is being tightened. When desired the lug can be turned at right angles to radial, thus allowing the clincher rim to be readily pulled off.

USE OF SKID-CHAINS ON TIRES

The Fisk Rubber Co. has arranged with a large company manufacturing chains to build a special chain which the Fisk people will recommend. This chain is in no way anchored either to tire or rim; the tread cross-pieces being longer than the usual type, so that they cover a larger surface of the tire. The Fisk company, in handling the new chains for its customers, will have sizes for its various types of rims and casings.

MOTOR CAR LITERATURE

An attractive feature of the 1910 Stearns catalog is that in illustrating the different car models the landscape background is introduced, this consisting of representative city and country home buildings and surroundings. A complete mechanical description of the different models is given together with the usual line of illustrations.

A feature of the December issue of the Ford Times is a full-page illustration of the combined flywheel, magneto and planetary gearset of the model T car.

One of the handsomest catalogs to make its appearance is that of the Pierce-Arrow Motor Car Co. It is a de luxe issue, of large size, on heavily enameled paper, and contains four full-page three-color plates showing different models of cars—not the stereotyped illustration, but water-color reproductions showing passengers leaving or entering the cars. One page is devoted exclusively to awards and records won by these cars. Group illustrations of parts are featured. One full-page group contains four different views of the motors with clutch and assembly. All of the different models are illustrated. A decorative feature used throughout is a series of photographic reproductions of Pierce cars on the recent Glidden tour. A complete and comprehensive description is included. The cover is an embossed monotone.

The November issue of the Chicago Automobile Club journal contains as its leader the plans for enlarging the present club quarters.

December issue of the Co-Operator, the house organ of the Maxwell-Briscoe Motor Co., contains a story by Ernest Coler on Change-Speed Transmissions.

A small folder has been issued by the Thomas company on the Thomas Fylers for 1910. It illustrates three types of bodies and gives complete specifications of models F, M, and R.

The General Mfg. Co., has a 1910 catalog in which are illustrated its different types of transmissions and clutches.

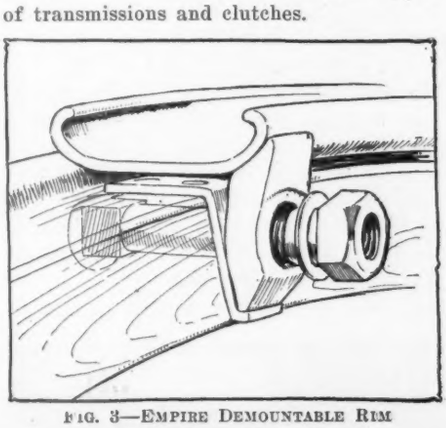


FIG. 3—EMPIRE DEMOUNTABLE RIM

FIG. 2—EMPIRE DEMOUNTABLE RIM

BRINGS OUT TIRE IDEA

Fred T. Roberts, of Omaha, Neb., has invented a punctureless tire which he has had patented in Germany, England, France and Canada. Instead of having a rubber tube filled with air for the inner tube the space within the outer tube is filled with cushion rubber. A strip of this, 120 inches long and 5 inches in diameter, takes the place of the inner tube. This has 117 little air chambers in it running the full length of the 120 inches. The pressure of the weight of the machine on the air in each one of these little chambers provides the resiliency, and at the same time there is plenty of resistance to bear the weight of the machine. A cross section of the inner tube somewhat resembles the side of a rubber stamp. The ends of the strip of cushion rubber are cemented together and the whole compressed into the outer tube.

STEEL WORK TRESTLE

The Luverne Automobile Co., Luverne, Minn., is marketing a line of steel trestles suitable for all work shops. These are made entirely of steel, hot-riveted together. They are manufactured so one will fit on top of another, thus enabling six or eight to be stacked in the same pile and so not taking up much valuable factory or floor space.

FOWLER GREASE GUN

The Fowler Brass Works, Chicago, is manufacturing a combination oil and grease gun. For grease purposes the piston is forced down by a spiral cut on the piston stem, giving a slow action. For oil a straight movement is given the piston, as in the ordinary oil gun. A combination release is used to engage the spiral feed for grease.

NEED OF PRECISION IN PARTS PRODUCTION

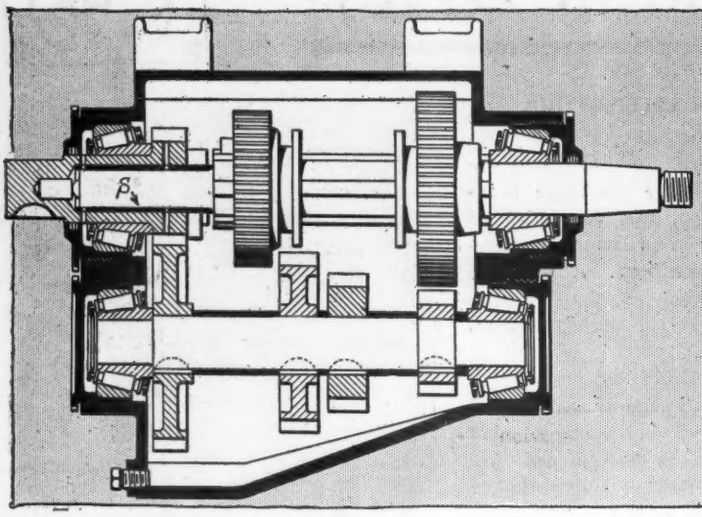


FIG. 1

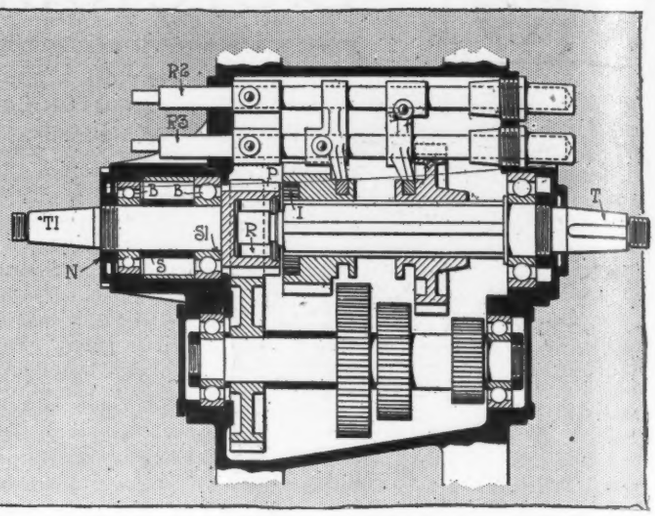


FIG. 2

By Thomas J. Fay

HISTORY, as it relates to the building of motor cars, holds in its maw many half-baked attempts, some flat failures, and much of success. When a car indicates that it is not going to make good history, as it happens to have a few parts in its make-up, made in some outside shop, the parts are condemned as being the faulty members, and parts makers are ladened with the odium.

Perhaps the maker of the parts followed directions, made them according to the drawings, and of the materials indicated in the specifications. If so, who is to blame? Certainly the designer should take all the responsibility of failure if the parts made and furnished are as per drawing and up to the requirements as respects materials. There still is another phase of the problem, entirely besides the story of who should shoulder the odium when failure is the reward of lack of quality of material or due to a surfeit of poor designing. If, when parts makers are requested to bid on work, they find that it is a cheap and incompetent product that is wanted, and the skill of the same parts makers is interjected, so that the work is moved up to a higher plane, it is assured that the end will be far more satisfactory and the business will grow and prosper. It may take a little tact to successfully interject a discussion of quality, especially when the work is to be done for inexperienced but ambitious makers of cars, who may think that anything is good enough to serve the purpose. If tact fails, and it will betimes, is it not then time to respectfully decline to participate in what is sure to be a flat failure?

Makers of parts are fast learning the futility of doing inferior work and many of them flatly decline to deviate from what they have learned by sad experience to be a safe course. It is all very well for some company to say: "We are building 1,000,000 cars of the $5,000 class to sell at $300." If it can be done, the sooner some clever concern accomplishes the task the better for the ultimate consumer. If it cannot be done, then the question is, will it pay parts makers to reduce quality below the point of safety to help put over a project which is deceptive? The class of parts makers who expect to survive says no, absolutely no!

In all fairness it is difficult to discover any experienced concern, at the present time, which will lend itself to any such an undertaking, and it is now the settled policy of the parts makers of acumen to keep well away from the class of work the nature of which will not survive a critical inspection and a road test.

Points Are Illustrated

Let us sojourn into a shop, examine the product, and learn, insofar as experience and a close examination will serve the end, what is a reasonable expectation. For the purpose the product of the General Mfg. Co., Elkhart, Ind., will be illustrated and described. This concern makes transmissions, clutches and such other parts as would seem to be in strong demand, having for customers companies which assemble cars.

As an illustration of the class of work done, referring specifically to transmission gears, reference may be had to Fig. 2, of the model M system, giving three speeds and reverse, selective, and attention is directed to the short, large diameter, main and lay shafts, rolling on Hess-Bright ball bearings of the annular type in housings of bronze with closures, thus eliminating the silt of the road and rendering lubrication as a normal expectation.

In this transmission the high speed is direct and a roller bearing R is placed at the telescope joint of the mainshaft and its extension. In going into direct on the high gear, engagement of a pinion P with an internal gear I has the virtue of rendering the shift easy and noiseless, and the work falls on many teeth, instead of—in some examples—four jaws. The extension shaft rolls on two sets of ball bearings, B B, so far apart that displacement is quite out of the question, and the universal joints, when they are to be adjusted into place, may be forced up on the taper ends of the shaft at T, and the extension at T1.

The mountings of the bearings, although they are anything but costly, conform to accepted practice in that the inner race is locked and the outer race is free to slide in the axle plane, being a sucking fit. As an example of this, refer to the two bearings on the extension shaft, and observe that a sleeve S serves as a spacer between them, and by pressure, which is induced by a threaded member N, the pressure is assured, due to reaction of the shoulder S1.

The selective means is so contrived as to manipulate the racks R2 and R3, and they, being of good diameter, sliding in liberally-proportioned phosphor bronze bearings, stand up to the work, sliding freely because they do not deform. The case is of aluminum of suitable thickness, noise considered, and is machined so accurately that it is grease-tight, and ribs are placed at points of maximum strain to assure that the case will not deform in service, pinch the bearings, and render the case leaky.

Ratios of Speed Reductions

In this type of gear the ratios of reductions of speeds are as follows:

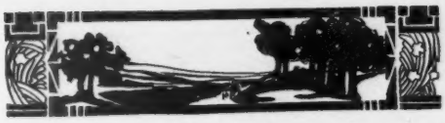
Direct on high	1 :1
Hill climbing	1 9-13 :1
Low	3 1-19 :1
Reverse	4 1-7 :1

With a view to showing how cost can be reduced without eliminating quality, Fig.

1 is offered, and in this example the materials used are the same in every particular excepting that the roller bearing at the telescope joint is displaced and a bronze sleeve S is substituted. The sleeve is long, made of a fine grade of bearing bronze, and is properly fitted into place. This telescope joint is used on many cars of proven quality, and some makers prefer it to ball or roller bearings for this duty. It is less expensive to make, works very well indeed, and in the absence of any diminution in quality of material or workmanship a difference of opinion is legitimate. The substitution of Timken roller bearings also is indicated in this figure, and Woodruff keys are used in conjunction with the keying of the gears into the shafts.

In this example the gear ratios are the same as in Fig. 2, and experience has shown that it is a good disposition of this important phase of the problem. The gears in this as well as in the example, Fig. 2, are of heat-treated Silico-manganese steel, and besides great hardness, kinetic ability is a marked quality. It has been proven, time after time, that teeth of gears made of this material, if they are properly hardened, are not only file hard but they may be deformed by exerting great pressure in a testing machine without showing signs of fracture. The test fracture is that of a fine grade of material, of great reliability under shock conditions, and shafts of the same material seem to complete the undertaking from a quality point of view.

In the plant of the General Mfg. Co. pyrometers, annealing equipment, methods of cementing, and means for quenching are available, and uniformity is one of the necessities that the company recognizes in the process of manufacture, hobbing machines, gear-cutters, and other equipment of the latest and available, and additions are being made as rapidly as the situation would seem to warrant.



Testing equipment and methods of inspection are all good practice demands, it having been found that when the work is well executed filing and fitting is eliminated and cost is reduced in proportion as accuracy creeps into the process, so costly machines which induce interchangeability soon pay for the excess initial cost.

Cone Clutch Is Liked

Despite the wide variety of multiple-disk and other forms of clutches, which found favor in cars designing in recent times, there still is a vast liking for the more simple form of cone clutch, especially in view of the utility of cork, in insert form, in conjunction with leather, for the facing. This type of clutch is produced by this company under license from the National Brake and Clutch Co., in sizes from 20 horsepower up. It is claimed for this type of clutch that it will not slip even if oiled, and it will not act fiercely in starting. Then, it is of great advantage to know that the leather facing will not heat and char, which the cork prevents.

In the absence of the cork inserts, it is necessary to place springs behind the leather facing, which is done in the manner as shown in Fig. 4, there being six of these springs evenly disposed around the periphery of the clutch. Among the mechanical features of note, the double universal joint J J, with a slip member S between, offers a means of eliminating the ills of road inequalities to a marked degree. The clutch spring S1 is concentric with the shell, and the pressure is sustained by a thrust ball bearing B.

The spider H is of aluminum of a suitable grade, taking into account the character of the work, which includes centrifugal forces as well as thrust, compression and angular distorsions. In machining, it is appreciated that the clutching members must engage with precision and care is exercised to have them meet fair, hold to concentric relations and assemble to a nicety every time.

Mechanical Differences Noted

Without attempting to show even a small measure of the deviations in mechanical details which attend the designing of clutches, it may be advantageous to show something of the possibilities. Fig. 3, for illustration, represents an important difference, since the pressure on the spring S may be increased or reduced by screwing up on the capscrew C, which is threaded into the shank of the shaft S1, and the ball thrust B served to sustain the reactive pressure.

The universal joint J, back of the clutch, consists of a housing with a broached—square—hole, and the male members M and M1 engaging. The spring S2 serves to keep the members M and M1 separated, and in assembling the power plant into the chassis the joint, so made, offers sufficient end-play to enable the units to be lifted out.

The clutch, as shown, including all its detail, represents stability, and the cost of the finished product is well within range, even considering cars which sport a modest price tag. What the situation portrays is that it is not necessary to reduce quality below a certain deserving level, and a little ingenuity, properly enlarged upon, will generally suffice for the purpose.

In both clutches, Figs. 3 and 4, the engaging springs are entirely enclosed where they are well protected. The small illustration at the top of Fig. 4 shows the arrangement of the short bow-shaped springs used beneath the leather facing when cork inserts are not used. The number of these springs inserted depends largely on the horsepower of the car in which the clutch is fitted.

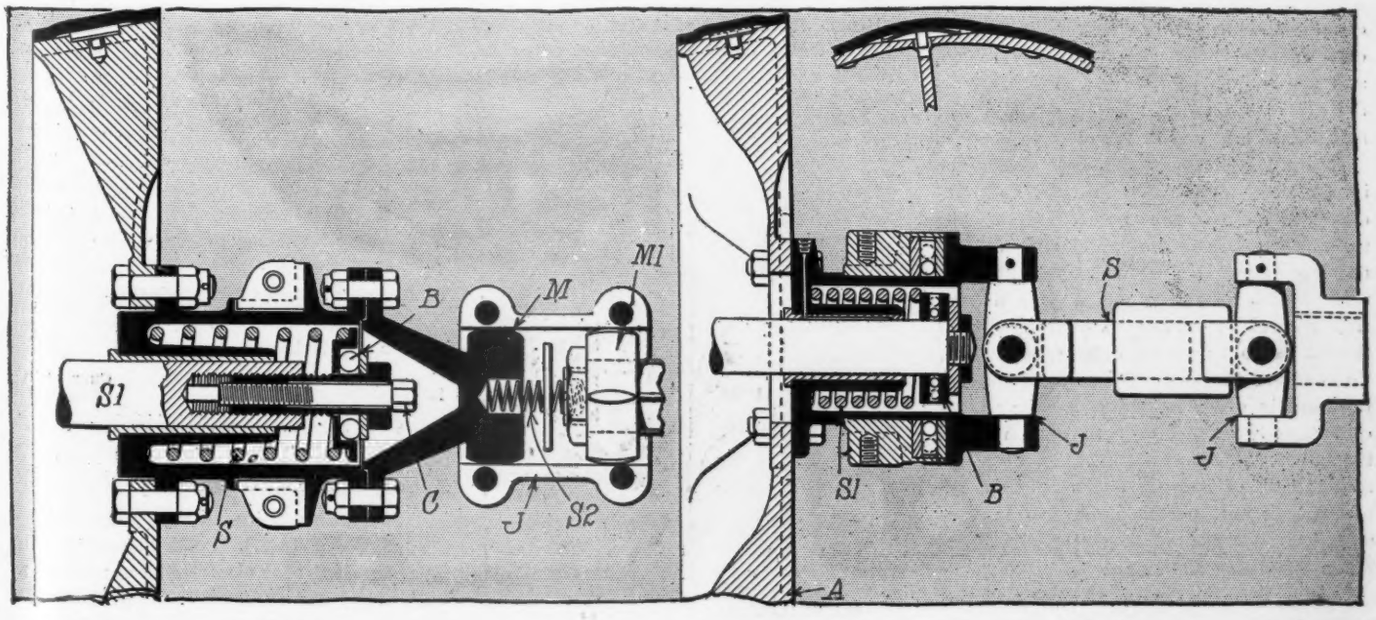


FIG. 3

FIG. 4

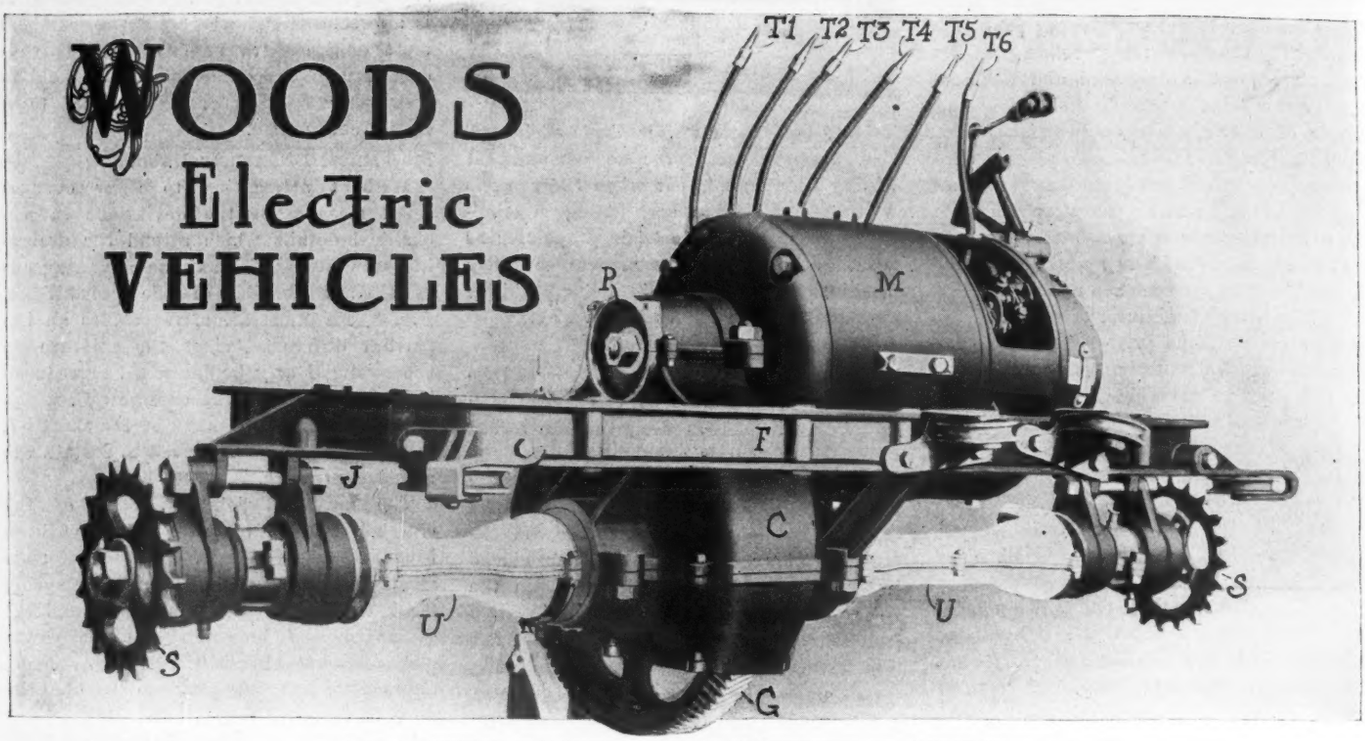


FIG. 1—SUPPORT OF WOODS MOTOR AND TRANSMISSION TO JACKSHAFT

FROM the first Wood's electric, which will be remembered as an improvised vehicle, to the 1910 product, one of which is illustrated in Fig. 3, is a far cry, and considering the many vicissitudes through which electrics progressed it is pleasant to dwell for a moment upon the time which has elapsed from the first Woods electric, some 13 years ago, to the finished article of today; nor should it be forgotten that the homespun of 1897 rested on a firm foundation. This very groundwork is responsible for the harmony which resides in the cars for 1910, and the coupe illustrated tells its own story of luxury, the poetry of motion, and by sharp contrast reminds one of the difference between the women who displaced mules in the mines in Wales a couple of centuries ago, who drew the coal cars because head room was too costly, and the women of today, who partake of the pleasures in life, sharing equally with men the advantages of the electric.

It has long been known that one motor is far more efficient than two, and efficiency is the matter of greatest moment in the motor equipment of an electric vehicle in view of the battery which must have a wide radius of action and a long life as well if cost of service as well as extent thereof is to be up to a fitting standard. To conserve the battery is to limit its output, and in order to realize a wide radius of action it is necessary to build up the torque of the motor in keeping with the expenditure of energy, which is a matter of using a unit power plant, and it, too, must have the desired characteristics.

Mean Efficiency Important

It is not the maximum efficiency of the power plant that counts; the mean efficiency must be noted, and this mean efficiency will be on the highest level if the motor is so designed that the torque—twisting moment—will be in direct proportion to the current in amperes which must be taken from the battery. The torque, for current, of the motor has been determined in the Wood's laboratory, and it may be set down as follows:

Current in Amperes	Torque in Pounds—Feet
10	2.4
20	8.8
30	16.6
40	25

Torque of the Motor

From the above it will be observed that the torque of the motor almost is in direct proportion to the battery output, and the draft on the battery is limited to that which is safe. In the meantime the speed of the motor decreases as the torque increases, about as follows:

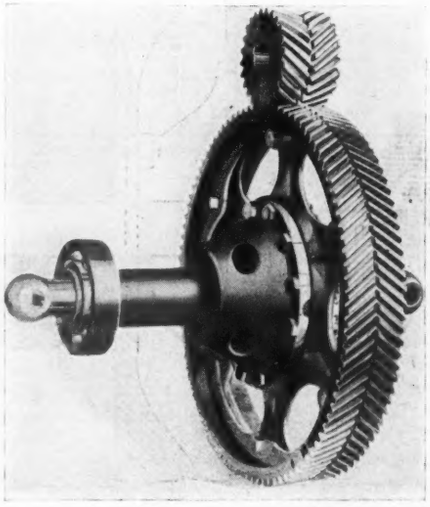


FIG. 2—WOODS GEAR TRANSMISSION

Speed in Revolutions per Minute	Current in Amperes	Torque in Pounds—Feet
1,820	10	2.4
1,600	11.6	2.9
1,400	13.3	4.0
1,200	16.2	5.9
1,000	20.0	8.8
800	28.2	15.0

The above values are as nearly as possible taken from curves plotted for the purpose, with data from actual tests in a well-equipped laboratory; the actual curves to be presented in an article to be prepared on the subject of the laboratory.

From what has been shown, it is possible to predict that the efficiency of the motor is nearly constant for the entire range of performance, and that the maximum efficiency will be at the highest speed and lowest current stated. The fixed losses are very low; this is the reason why the maximum efficiency is at maximum speed, it being the case that the $I^2 R$ losses increase with the current, they being in proportion to the square of the current. By using copper wire of relatively large section, the internal resistance of the windings on both the armature and fields is held so low that increased torque is not attended by heavy losses, and the efficiency of the motor at all speeds in maintained nearly constant, as the following tabulation will adequately indicate:

Efficiency in Per Cent	Current in Amperes
82	10
84	20
81.6	30
79.5	40

Battery Life Now Satisfactory

When it is considered that these values for efficiency interpret all losses, it will be recognized that electrics have reached a high state, and there are good grounds for claiming that battery life is now satisfactory. Referring again to Fig. 1, M is the

motor, transmitting power to the gear G through the pinion P, which is equalized by means of a differential gearset within the case C, and in proportion to the needs the power is transmitted through the universal shafts within the two cases U to the sprockets S. The frame F fastens to the under body, which acts as a chassis frame, and by means of two hinge joints J the motion of the body is compensated for so that the sprocket chains are maintained in perfect alignment at all times.

Electrical connections are made by means of terminals T—1, 2, 3, 4, 5 and 6, which lead to the windings of the motor and by means of the wiring system provided in the body proper, connect with the controller, through which to the battery, thus completing the connections, for the desired purpose. This electrical wiring system offers evidence of the very systematic way in which the wiring is cared for, it being the case that every part of the wiring is accessible for repair, and what is more to the point, it may be inspected at will; these provisions do not prevent adequate protection of the wiring at every point, so that depreciation, which was in former times a serious matter, is reduced to the vanishing point in these cars.

Features of Motor Portrayed

Fig. 1, while it shows the motor in combination with the means for its proper application to the work, is too complicated to properly bring out the design features that make for entire success so that Fig. 4 is here offered for the purpose of accentuating the remaining points to be touched upon. In this figure A is the armature, which is laminated and slotted to accommodate the windings W, of which there are a suitable number, and the alternating waves are commuted at the commutator K,

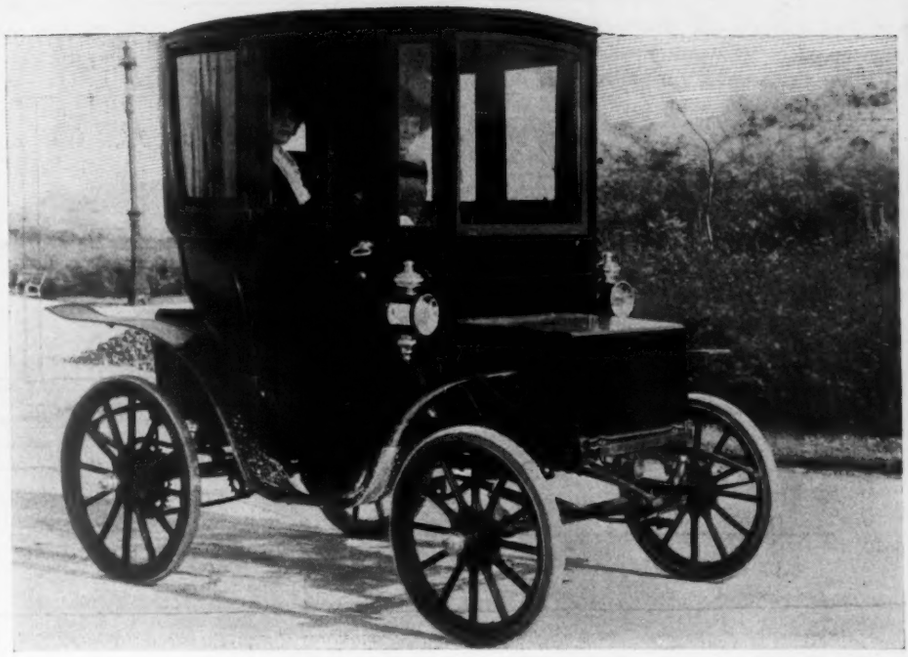


FIG. 3—WOODS ELECTRIC COUPE

which is made of a considerable number of rolled lake copper, each insulated from each other and the frame by means of lamanae of Indian amber mica of the finest selection. The lamanae of the armature are of Swedish iron, rendered soft by annealing and aged to prevent hysteresis deterioration. The armature windings are what are technically designated as form wound, insulated with sea island cotton and taped. They then are saturated with insulating varnish and baked to expel dampness, which process seals up all the little openings and dampness cannot thereafter penetrate into the insulation.

The armature revolves on the shaft S1, in two Hess-Bright ball bearings B, which shaft is of special steel, ground to exact size after machining, and the whole is balanced both in a kinetic as well as a static sense in a suitable balancing equipment after the work is done. The Hess-Bright bearings fit in the bore of the two housing spiders S2 which in turn bolt to the circular field magnet F1 in which the four poles, one of which is designated as P1, are secured, on which poles the field windings, one of which is designated as W1, are placed after they are form-wound. Current is led to the commutator K at four diametrically opposite points by means of brushes which are clamped into four holders, one of which is indexed Z, they being secured to, but insulated from the housing

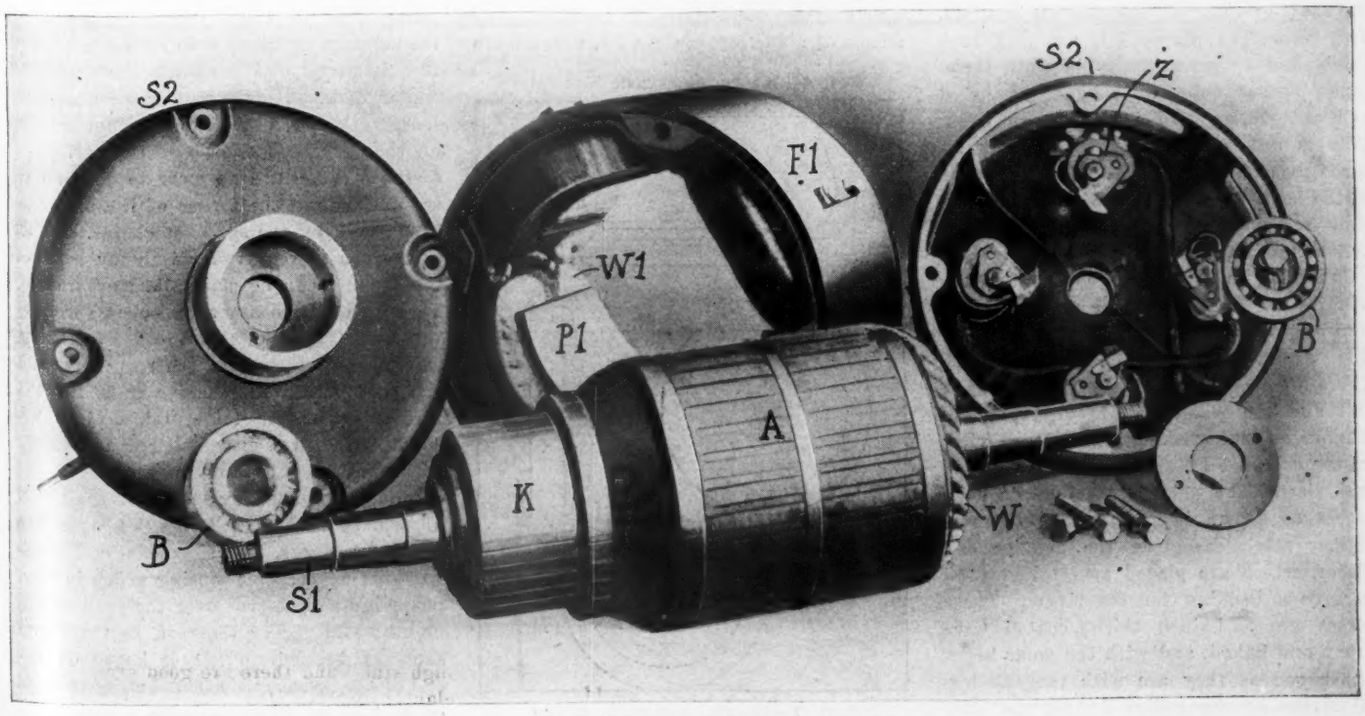


FIG. 4—WOODS ELECTRIC MOTOR SHOWING COMPONENT PARTS

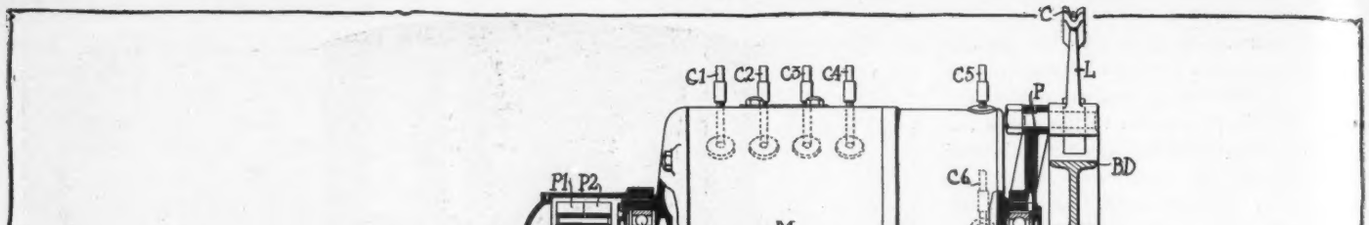


FIG. 5—VERTICAL SECTION OF CROSS SHAFT ON WOODS ELECTRIC MACHINES

spider S2, but well insulated therefrom.

The armature windings, which are done in a winding machine, are shaped as in Fig. 6, in which A is the plan, B is looking at one diameter, and C is an end view. Each coil has six turns of wire It is then wrapped with tape, dipped in Colman's black insulating varnish and then wrapped and dipped again in shellac. The armature slots are presented in Fig. 7 at N in the periphery of L, there being thirty-three of such slots. The transformer iron of which the disks are made is shown as respects thickness by L1, the plan of which is offered at L2. The disks are keyed on to the shaft, keyways K in L and L2 checking with K1 in P1, and K2 in P2. P1 and P2 are the end plates by means of which the disks are clamped into tight relation on the shaft or armature spindle as it is called. The respective plates, L1, are .017 inch thick, and to permanently insulate them, japan is put on evenly, by means of a printer's roller, and baked in an oven. This is an extremely important process, for if paper is used instead as sometimes it is, the heat, which is quite high when overloads are encountered, will char the paper and the insulation then will be destroyed.

Referring to Fig. 8 P is the plan of the winding, of which four are used, and the terminals T1 are of heavily-insulated flexible wire leading out to the terminals. There are sixty-three turns of wire on each coil and the whole coil is taped in the manner as indicated. P1 is an edge view of the coil and P2 shows the same coil in end view. The polar extensions or pole-pieces as shown in Fig. 9 are of transformer steel, excepting the heavier end plates, which are placed as retainers and to give a backing for the rivets. These plates are .031 inch thick, coated with japan and baked, and with the polar horns H, shaped as they are with tangent terminations of the radius 3.0825, the commutation is sparkless, which is a matter of the greatest importance and fixed losses are confined to a minimum.

Flexibility Retained Without Handicap

In order to clearly illustrate the power plant with a view to offering the best evidence of flexibility, it will be best to present a section through the motor, universal joints, tumbleshafts, etc., as offered in Fig. 5, in which M is the motor shell, B2 the two Hess-Bright bearings on the armature spindle, P1 and P2 the halves of the herringbone pinion, which meshes with G1 and G2, the two members of the herringbone gear which in turn is flanged onto the differential gear housing and is held in place by holding bolts.

The differential system is of the bevel type with members G3 keyed to short axle shafts. Compensation is established by means of planetary pinions P3, which mesh

FIG. 6—WOODS ARMATURE WINDINGS

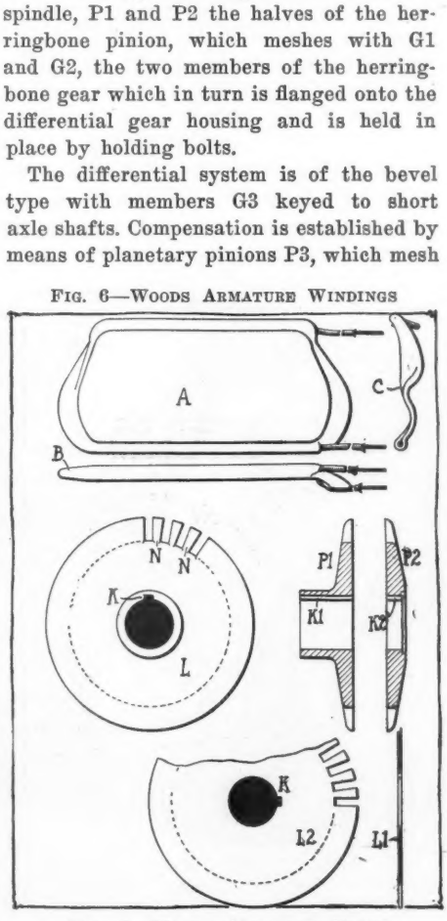


FIG. 7—WOODS ARMATURE DISKS

with the gears G3, which pinions rotate on spindles of the spider, which in turn rotates on a bearing which is threaded over the ends of the axle shafts, serving to fetch up the gears G3 on the taper T1 and T2. Keys K also are provided to resist all twisting moments. Hess-Bright ball bearings support the differential housing and the power of the motor is duly transmitted to the tumbleshafts T through the universal joints J. From the tumbleshafts power is transmitted to the sprocket pinionshafts SP through other universal joints J1 from whence the power passes to the sprocket pinions. The stubshaft on which the sprocket pinions are keyed run on Hess-Bright ball bearings HB.

The sprocket pinions on their stubshafts, being in housings H1 which in turn swing free on hinge joints connect with the supporting frame F in such a way that the distance rods R maintain the center-to-center distance between the sprocket pinions, with the respective sprocket wheels on the rear road wheels of the car. The distance rods have no more to do than to sustain against the torque of the motor as it is taken by the sprocket chains, and as to the chains they run noiselessly because the spacing can be maintained accurately. True, in order to assure noiseless sprocket work, the sprockets are cut accurately, using good material in the sprockets, and the most approved machine tools for the fashioning of the teeth, taking into account the desired clearance and absolutely accurate bottom distance of the teeth.

Mud is excluded by means of the shells U which have ball joints T4 over the universal joints. These shells co-operate with the differential housing which in turn passes up and sleeves over the shell of the motor at M2. For the rest, as the figure shows, a brakedrum BD, is keyed on the end of the armatureshaft and a nut threads on to the end of the spindle, pressing the

drum up to a proper fit. The brakeband is faced with friction material F2 and the band is prevented from rotating when pressure is applied, by means of the pin P, which is secured in a reamed hole, in the boss of the spider S. Pressure is applied to the brake band by means of the lever L when a pull is applied to the cable C. Electrical energy is supplied to the motor from the battery through the controller by means of the cables C1, C2, C3, C4, C5 and C6.

Noiselessness Attained

Glancing at Fig. 2, which is of the gear system, it will be plain that designing for noiselessness was the great question and it comes as an incident that this same desire is only to be carried to a successful termination by the use of superior materials, and the closest possible limits of tolerance in the shop. The herringbone idea is reduced to practice in this example by accurately machining two members for the gear and pinion respectively and they in turn are cut spirally, so that when they are bolted together they eliminate backlash and transmit the power of the motor noiselessly.

Details Bespeak Quality

Were it possible to present every working drawing of the cars made it then would be a simple matter to point out to what extent details in design are perfected; rather than space every drawing in a mass of detail, which would render this story futile, just one or two characteristic examples will be taken instead. Fig. 10, for illustration, shows how cables C are secured to brake arms and since the cables are of silico-bronze, which is permanent and strong, the equalization of the load, between the two brake drums is taken care of by means of pulley-blocks. The method here shown offers strength, ease of repair and eliminates uncertainty.

Fig. 11 of the steering control system is sufficiently clear as not to require discussion in detail. The tubing used is cold-drawn nickel steel and the ball-and-socket joints

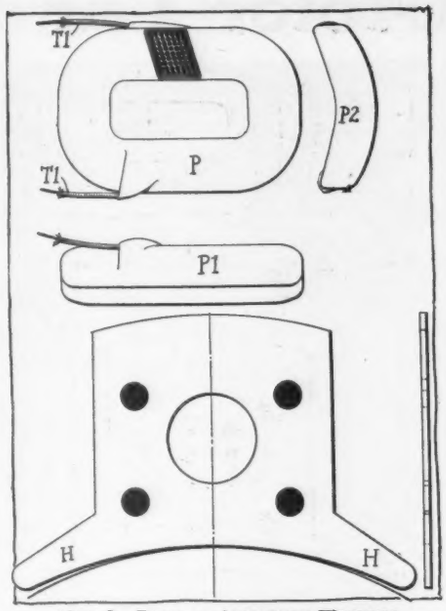


FIG. 8—PLAN OF ARMATURE WINDING
FIG. 9—POLAR EXTENSIONS OF POLE PIECES

are made from die forgings of special steel machined accurately, heat-treated to render the bearings glass-hard, and the while high in shock ability. Referring to the ball joint on the end of the steering arm L, the safety member prevents the ball from departing from the socket. Dirt is excluded as well.

Among the other details not shown, the drum controller may be mentioned as entitled to recognition, it being of the street railway type, strong, well-made, properly insulated and lasting. This controller is selective in action and affords absolutely no chance for the operator to make a mistake. The Woods platform springs make for easy riding and the solid tires, made from a rubber composition by Woods formula, work so well that road inequalities are negotiated without any trouble at all. The use of Hess-Bright ball bearings of the well-known annular type, in road wheels as well as throughout the power plant, is calculated by the Woods designer to eliminate nearly all friction, and tire tests, using the Woods tire dynamometer, have demonstrated many points which were taken advantage of from the tire point of view.

The use of Exide batteries in Woods vehicles, has obtained for such a long time that little need be said from this point of view. It is the policy of the Woods company to use enough cells of battery to make charging economical, so that forty-two cells are most frequently employed. This is a matter, however, which is varied to suit the locality, taking into account the voltage of the charging circuit.

The Woods company has a contract with the Electric Storage Battery Co., maker of the Exide, whereby the battery company maintains a charging station nearby, and fresh batteries are delivered the day they are ordered for new cars.

MAKING CARS AT JANESVILLE

The Wisconsin Carriage Co., of Janesville, Wis., one of the largest vehicle manufacturers in the west, announced this week that it has completed its first model of a new type of motor car, and that it will build 100 cars for 1910. The new car, which has not yet been named, is equipped with a standard four-cylinder water-cooled engine, with a bore of 4⅜ inches and a stroke of 4¾ inches, rating 40⅝ horsepower by the A. L. A. M. formula. The motor is equipped with a Schebler carbureter and double ignition, with Bosch high-tension magneto and coil and timer. It has selective type transmission, three speeds forward and reverse, running on annular ball bearings. The cone clutch is chrome-leather faced with springs under the leather for gradual enlargement. The rear axle is of the full floating type, of pressed steel, with torsion tube enclosing the driveshaft. The front axle is double channel section pressed steel. Front springs are semi-elliptic and the rear springs three-quarters elliptic. The wheelbase is 115 inches with artillery wheels 34 by 4 inches.

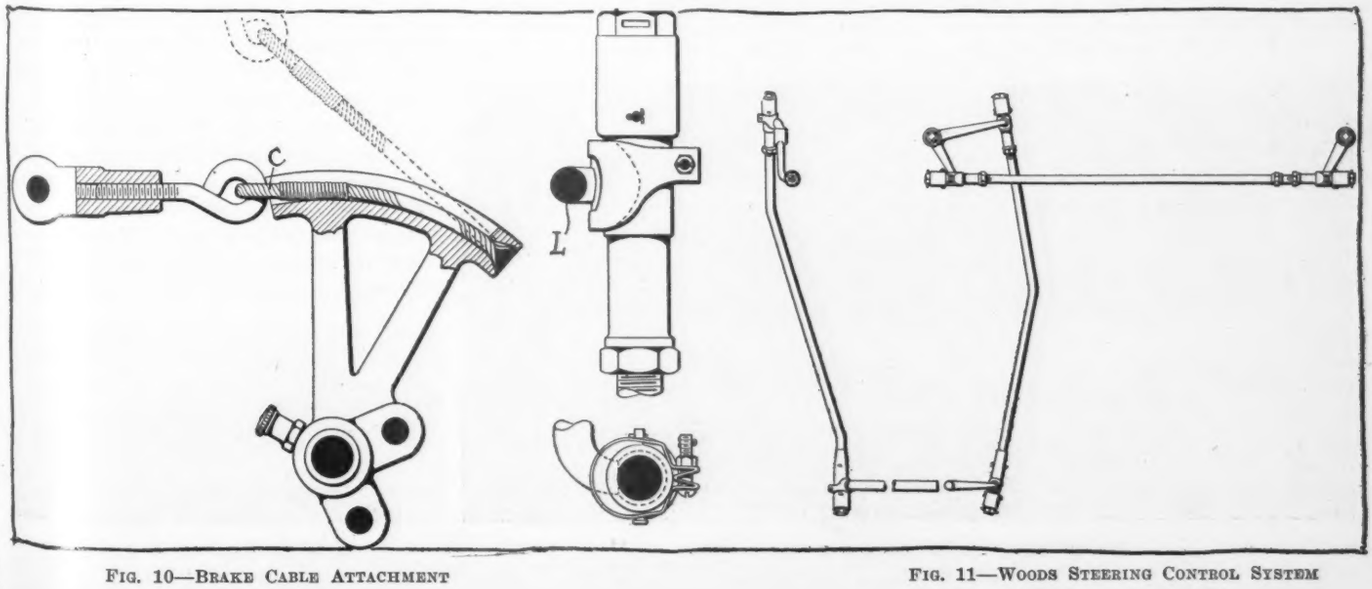


FIG. 10—BRAKE CABLE ATTACHMENT

FIG. 11—WOODS STEERING CONTROL SYSTEM

Motor Car Development

A NEWCOMER in the 1910 motor car field from Indianapolis, Ind., is the Parry, built by the Parry Motor Car Co. The Parry is a four-cylinder five-passenger touring car, fitted with a valve-in-the-head motor with cylinders 4¼-inch bore and 4½-inch stroke. According to A. L. A. M. rating the horsepower is 28.9. The car is made in two models—roadster in addition to the five-passenger touring car. Present arrangements are to build 5,000 of these for next year. The Parry car does not incorporate any radical novelties. The motor and other parts are conventional in the majority of respects.

The cylinders are cast in pairs, of gray iron, with valves in the head as depicted in Fig. 4, and the radiator, which is on the center line of the front axle, is so spaced as to afford room for a commodious fan, so that the air current through the radiator is adequate for the needs.

The tappet rods, for the valve-motion, run in long and well-fashioned guides, have liberal bearings where the rockers engage, and the camshaft, with integral cams, is of special steel, with ground cams. The flywheel is large, with an adequate flywheel effect, and the main bearing of the motor, in view of this, is of unusual projected area. The crankshaft is a die forging of toughened special steel, has three main bearings of die-cast white metal, and is best understood by glancing at the open crankcase with the shaft in place, as shown in Fig. 5, which also tells that the lower half is not required to carry any of the crankshaft load, since journal caps are used instead.

The half-time gears are housed in, are accurately cut, set to run on the pitch line and are noiseless. Ignition is by means of a magneto which sits on the right side of the motor as Fig. 4 portrays, and the water pump, of the centrifugal type, is just in front of the magneto on the same side. The steering gear is fastened to the chassis frame at a point between the magneto and the water pump, and the spindle passes through the chassis frame just in front of the anchorage of the rear end of the front spring suspension.

Fig. 3 is of the front axle, and this, in conjunction with Fig. 4, is enough to clearly indicate the character of the steering equipment, taking it as a whole. The linkages and arms are of suitable grades of fabricated steel and straight-line designing is the rule. The front axle is of the I section, die forged in one piece and Elliot type of knuckles add to the line of attractions. The spring perches are integral with the axle, and half-elliptic springs are made to take the constant front load. At the rear of the chassis, owing to the variable nature of the load, the designer has taken advantage of elliptic scroll springs, besides using an adequate volume of good material. The chassis frame is of steel, hot pressed to a channel section, and the aim has not been to skimp in material at this point; absence of castings or other heavy parts at other points has enabled the designer to see his way clear to afford a rigid chassis frame.

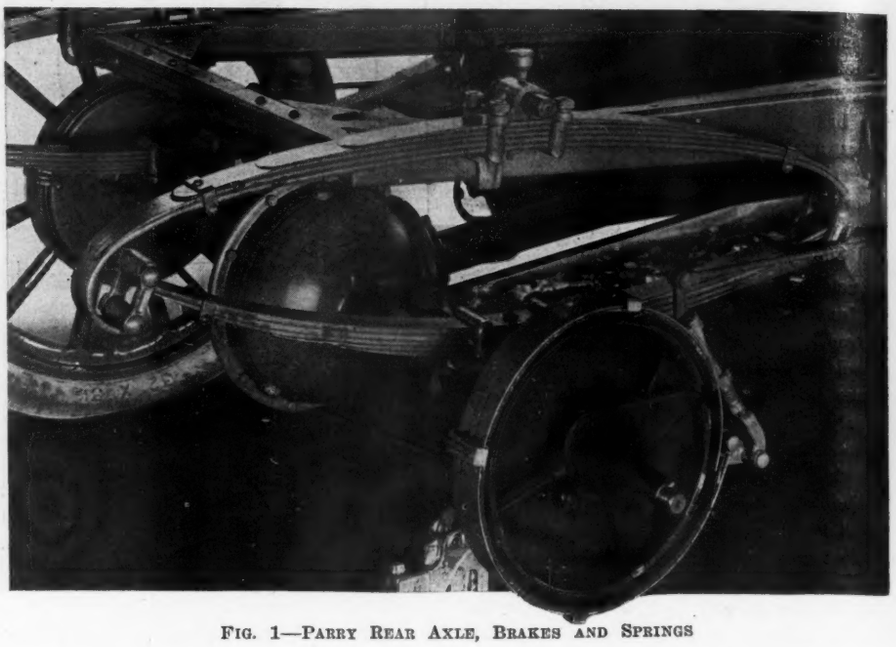


FIG. 1—PARRY REAR AXLE, BRAKES AND SPRINGS

The rear axle, unlike the front, is illustrated in Fig. 1, showing a liberally-designed tubular construction with a shapely bulb at the center in which the differential gear and the bevel drive is housed. The torsion tube is concentric with the propellershaft and terminates in a universal joint at the unit transmission gear, back of the motor, resting on the chassis frame.

Referring again to Fig. 1, notice may be taken of the brakes, of which there are two sets, one of which expanding and the other is external construction; both are faced with thermoid, the nature of which is such that any amount of heating such as it will get in this service fails to destroy its good working qualities. The bands are of steel, and the levers are not only of good section but they are fashioned with long bearings, and grease cups are placed at accessible points so that there is no reason why the original noiseless operation of the car may not hold out.

Wheels are of the artillery type, made with care from second-growth hickory, and the rims for the tires are quick-detachable, to fit 32 by 3½ tires. The tread is standard, and the wheelbase is long. There are other nice features to be noticed, as a 17-inch steering wheel, and the side levers, one of which is for the emergency brake, and the other for the three-speed selective transmission gear are shapely, strong, work with ease and precision, and are forged from a good quality of steel.

In the direction of long life and stability, there are several points that will re-

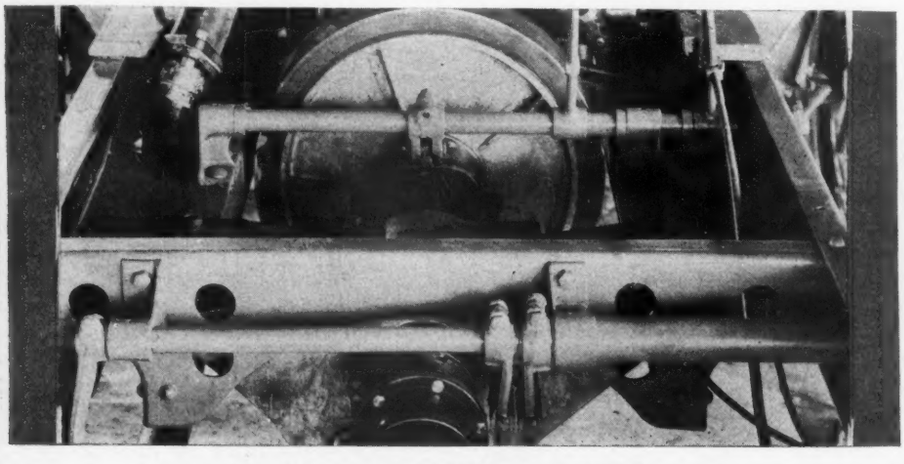


FIG. 2—STOUT CROSS MEMBER OF PARRY FRAME

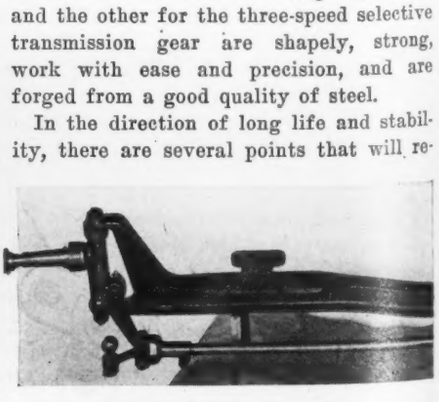


FIG. 3—PARRY AXLE END

Parry Newcomer in 1910

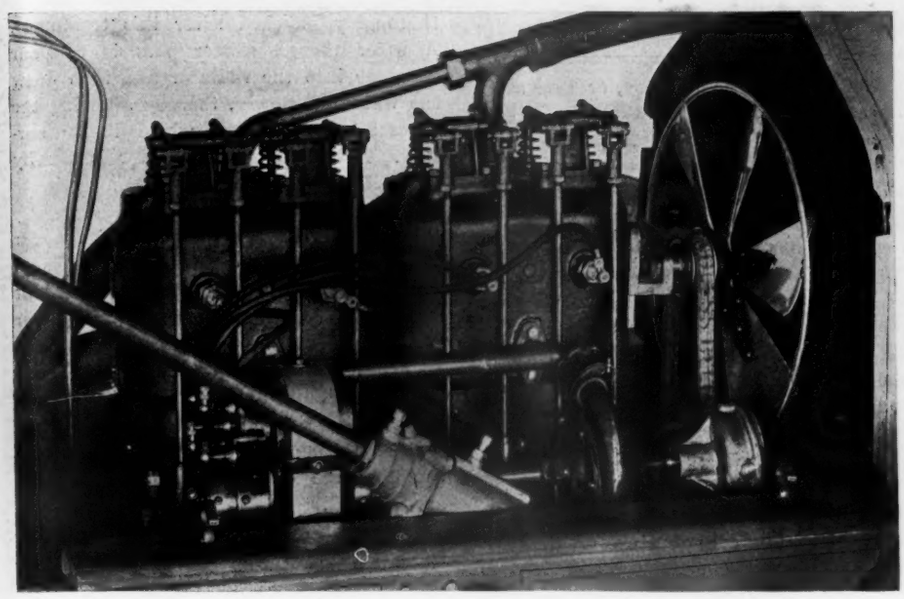


FIG. 4—PARRY FOUR-CYLINDER MOTOR WITH VALVES IN HEAD

ceive the barest mention at this time; Fig. 2 showing the chassis just back of the flywheel, presents evidences of this stability. The cross-member at this point is deep, and the subframe, which serves as a foundation for the motor, terminates at this member. All bearings and supports for the pedal and brakes fasten to substantial members, and no cantilever parts can be seen at any point, so that bending or other distortions will scarcely be a companion to the owner of such a car.

What the writer found was the old Standard Wheel company's buildings, completely filled with machinery and parts for the making of cars, of which the above is but a brief description. Then, there are new buildings in course of erection. The new structures are of steel, and, although they look a little hasty, even so, they are of a substantial character, and the wonder is that they can be put up in such a short time. The entire time taken by this company in doing all this work, including the delivery of model cars, has happened within 96 days.

The manufacture of 5,000 cars in one season is a big task, but President D. M. Parry figures on accomplishing this. The factory preparations are well in hand. A monster Bowser gasoline tank, so large that it completely filled a flat car, has been installed for storage purposes. A supply of magnetos is already on hand, in spite of the enormous demand for such apparatus, and in the assembling room a big supply of complete rear axles was on hand when the plant was visited.

In the forge all is activity, parts are being fashioned from bars and billets of steel, and a little to one side the frames are being riveted together. At another point, not far distant, motors are being assembled, and although the building is still ringing with the hammers of carpenters and house-smiths, the motors rapidly assume shape and the sharp exhaust reports of well-timed motors swell the din of noises that are all the more accentuated because the plant is being built and the cars are being made at the same time; what will these men do when they have but one task to perform, that is, make cars.

BUILDS MONO-MAN CAR

In a densely-populated country such as France and England many a doctor, commercial traveler, road surveyor and others have objected to be obliged to use a two-passenger motor car, one seat of which never was occupied. There appeared to be a market for a one man machine, as economical to run as a motor cycle, but with all the comfort and roadability of a complete motor car. A machine of this type has just been placed on the market in France under the name of the Zebra. Except that it has only room for one passenger and has very small dimensions, there is nothing startling in its construction. Its general design, in fact, is most conventional. A pressed steel frame, dropped to place the body low, carries a single-cylinder motor of 5 horsepower under a bonnet in the usual position. The motor has mechanical valves, thermo-syphon cooling through a tubular radiator, and relies on a high-tension magneto entirely for its indispensable spark. The gasoline and oil tanks are mounted on the dashboard, with feed, of course, by gravity. A multiple-disk clutch connects the engine to the sliding gearset having three speeds and reverse and final drive is taken by a propellershaft to the rear live axle. On such a light production there is no necessity for torque rods. Brakes are on the rear wheel drums and are enclosed, with a foot brake on the pulley at rear of the gearbox. The steering column, instead of being on one side, is placed in the center, with the brake and change speed levers in the usual position. Completely fitted with a two-seated body and hood the car weighs 660 pounds. Its speed on the level is 25 miles an hour. Although a very well-finished job mechanically, the small car has the defect of not being sufficiently fitted up in details for the class of users it is intended to serve. The man requiring a one-passenger car generally uses it from 8 to 10 hours a day, and in consequence calls for a considerable amount of protection not only for himself, but for the organs of the car as well. In this respect the small car is rather defective. This could readily be added by body improvements. It is generally anticipated among the industry that there is a big field for the mono-man car, particularly in densely-populated districts where the commercial traveler can use it.

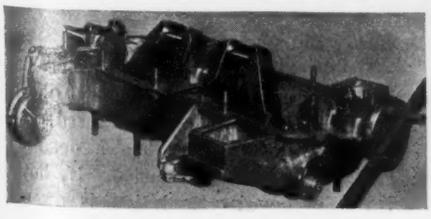


FIG. 5—PARRY CRANKSHAFT

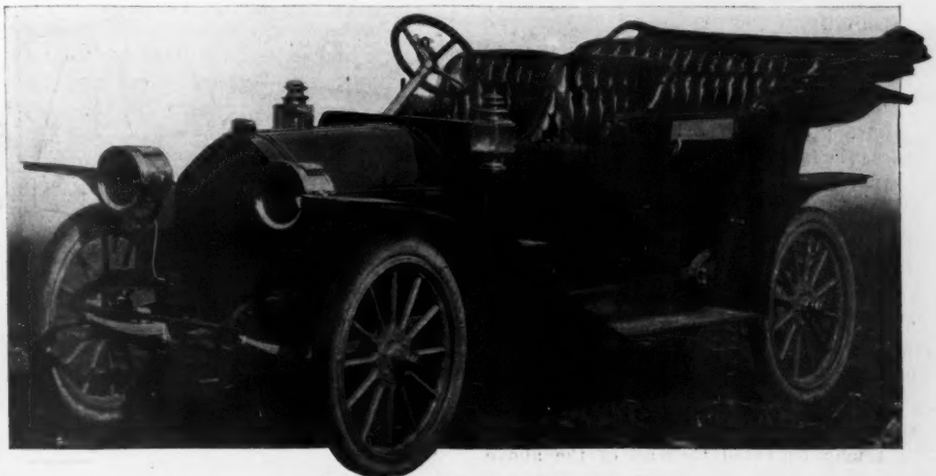


FIG. 6—FIVE-PASSENGER TOURING CAR

PUTTING THE MOTOR CAR UP FOR THE WINTER

By Herbert L. Towle

THE procedure followed in keeping an unused car through the winter may vary all the way from simply letting it stand untouched in a warm garage with the air gradually oozing away from its unsupported tires, to complete dismantling and overhauling. So much depends on the condition of the car, the conditions of the garage and the owner's inclination, that no hard-and-fast set of rules can be laid down. When, as last year, the winter happens to be very open, the question is further complicated by the fact that many cars are not really laid up at all, but are kept on call for occasional use right through the cold weather.

In the following paragraphs it will be assumed that the owner houses the car on his own premises and that the winter is cold enough to lead him to put it definitely out of commission for 3 or 4 months. In that case it is possible to lay down certain minimum requirements applicable to all cases. These requirements are based simply on the fact that it is, in the end, easier and cheaper to adopt the protective measures specified than it is to neglect them. Certain things have to be done anyway, and it is easier to do them before the 3 months' interval than after. The minimum requirements may be summarized as follows:

1—Wash and polish body and painted work generally.

2—Drain and wash out radiator if engine is water-cooled.

3—Care for tires as detailed in a following paragraph.

4—Empty and clean gas generator.

5—Polish the unpainted ironwork, if any, and smear with vaseline.

6—Empty and clean oil lamps, and soak wicks in gasoline.

7—Polish brass work and wrap it in paper or cloth.

8—Wash down engine, gearbox, etc., with kerosene, if coated with oil and dust.

9—Clean carbon from piston and cylinder heads, flush cylinders with kerosene, empty oil from crankcase and refill with fresh oil.

10—Clean oil or grease from gearbox and rear axle and refill.

11—Clean steering gear, steering link joints, propellor shaft joints, etc., and repack with grease.

12—Overhaul brakes and refit as needed.

13—If generator is used, clean out gas piping and, in the spring, renew rubber tubing and gas bags.

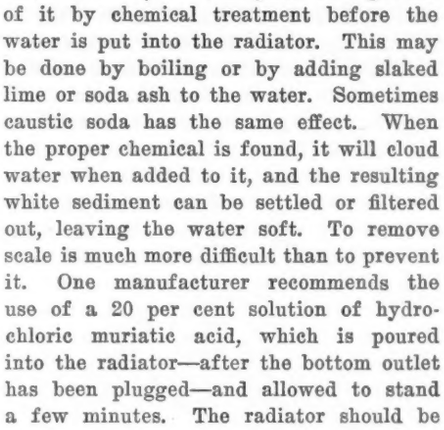
14—Give the storage battery a full charge, supplemented every month or 6 weeks during the winter by a freshening charge.

15—Renew the rubber hose connections to and from radiator if needed.

It may be noted that all of the above things represent labor that must be bestowed, if not on laying up the car, then on putting it in commission, or soon after. In some items, notably the care of the generator and brass work, labor is saved by doing it at the outset. In others, notably the care of the paint and the tires, positive injury is suffered by neglect. In the remainder, the logical time to do the work is when the car cannot be used. All of them are needful, even though complete shop-overhauling be not undertaken. If the car is to be overhauled, the work should be done before laying up, rather than in the spring. Suggestions will be given later covering this point.

Cleaning the Radiator

2—Every radiator should be washed out occasionally, whether hard or soft water is used, in order to get rid of the rust which otherwise deposits in it. A good plan is to disconnect the hose connection between the top of the engine and the radiator, start the motor and run a stream from a hose into the top of the radiator while the engine ejects the muddy water at the top. If hard water is used, it may or may not form a scale rapidly, according to the character of the dissolved matter. If scale is not rapidly formed, it is necessary only to wash out the radiator occasionally to keep it free. If scale tends to form, the best plan is to get rid of it by chemical treatment before the water is put into the radiator. This may be done by boiling or by adding slaked lime or soda ash to the water. Sometimes caustic soda has the same effect. When the proper chemical is found, it will cloud water when added to it, and the resulting white sediment can be settled or filtered out, leaving the water soft. To remove scale is much more difficult than to prevent it. One manufacturer recommends the use of a 20 per cent solution of hydrochloric muriatic acid, which is poured into the radiator—after the bottom outlet has been plugged—and allowed to stand a few minutes. The radiator should be thoroughly polished after this treatment. A safer though slower plan is to pour kerosene into the radiator and then draw the water off slowly, thereby allowing the kerosene to coat the whole inside surface. A badly-crusted radiator is usually a hopeless proposition.



"Run a Stream From a Hose Into the Top of the Radiator While the Engine Ejects the Muddy Water"

Attention Given Tires

3—If the car is to be out of use for a short time only, or if the winter is so mild that the car is liable to be used at short notice, simply deflate the tires after propping up the axles on horses or blocks. If you have a vulcanizer this is a good time to repair the cuts in the treads. Deflate the tires partially, so that they will fit the shape of the vulcanizer, and complete the deflation after the repairs are finished.

If the car is to be definitely laid up, it is best to take the tires off altogether. Deflate the inner tubes and wrap them separately. The garage, if cold, is a good place to store both the tires and the battery. Examine the casings outside and inside for needed repairs, and if they are all right wrap them also in paper.

The winter is an excellent time to overhaul the rims, which are probably rusted and in need of attention. The rust should be hammered, scraped and sand-papered off, and the rims painted. Shellac is sometimes used, but it is apt to stick to the casings. There are graphite paints used for preserving structural iron work which are excellent for this purpose.

Cleaning the Gas Generator

4—If the generator has a hair filter it is likely to need renewing. The gas outlets also will bear being poked through with a coarse wire—a bicycle spoke is good—to free them of their gradual accumulations of damp scale.

5—Bright iron work is not abundant about a motor car for obvious reasons. This item is not likely to consume much time.

6—The wicks of oil lamps gradually clog, but are easily restored to usefulness by washing in gasoline.

7—Brass work tarnishes quickly when exposed to the air, and especially to moisture. If wrapped in paper it preserves its luster a long time, consequently an easy polishing when laying up the car saves a much more laborious one in the spring, provided the lamps, etc., are wrapped. It is not necessary to take them off the car, unless there is a possibility of their being stolen.

Removing the Carbon

9—The best way to remove carbon depends on the conditions. If a good chemical carbon remover has been used frequently, nothing further than a dose of the same is likely to be needed. If, however, the carbon accumulation is at all thick, it must be removed by scraping. This does not necessarily require that the

cylinders be taken off—assuming that stripping is not otherwise required. It is usually a simple matter to forge soft steel hoe-shaped scrapers suitably bent and formed to be introduced through the openings over the valves or through horizontal spark plug holes. With these scrapers the carbon on the piston heads at least, and most of that in the cylinder as well, may be detached and drawn into the valve chamber, where it is easily scooped up. It is better not to use kerosene to soften the carbon, unless it cannot be detached dry, since the wet fragments of carbon are more likely to stick and remain behind when the job is supposed to be finished.

Although it is possible that the piston rings may be perfectly free and unclogged, it is more likely that they may be helped by dosing the cylinders liberally with special carbon removers or kerosene after the carbon has been removed. These should stay in the engine over night, and in the morning the engine should be cranked several times over with the relief cocks open. This will work part of the carbon remover into the crankcase, and the remainder out from the exhaust. The drain plugs in the crankcase should then be opened, and, after drawing off the mingled oil and dirty remover or kerosene, 2 or 3 quarts of carbon remover kerosene should be poured in through the breathers and the engine started and run fast for a few seconds only. This will splash the liquid thoroughly into every corner and bearing in the crankcase. After this has been drawn off, the crankcase should be refilled with fresh oil, and the engine run a few moments to splash it into the bearings.

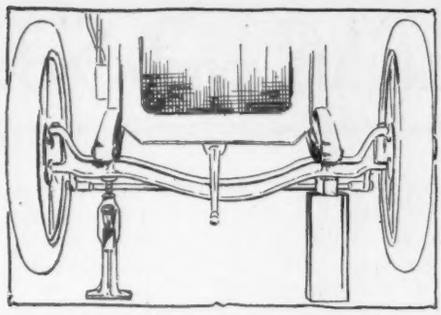
10—After scooping out the thick oil or grease from the gearbox and rear axle, kerosene should be poured in and let stand several days to dissolve the remaining lubricant as much as possible. This will make the final cleaning comparatively simple.

Cleaning Steering Gear

11—If the reducing gear of the steering mechanism has been kept packed with grease, it may not need taking apart for cleaning, as the grease tends to work out rather quickly, carrying the dirt along with it. The steering link joints, and likewise the propellor shaft joints, etc., are certain to need attention. In packing these the chief caution needed is to use quite thin grease, as thin, in fact, as they will hold. A heavy grease does not work in properly, and the bearing surfaces soon become perfectly dry, despite the grease with which they are surrounded.

Attention Given Brakes

12—Practically all brakes include one or a series of levers in their operating mechanism. These levers are most effective when they lie at right angles to the line of pull, but as the brake shoes wear and the adjustments are taken up, the levers depart more and more from the



"Deflate the Tires After Propping Up the Axles on Horses or Blocks"

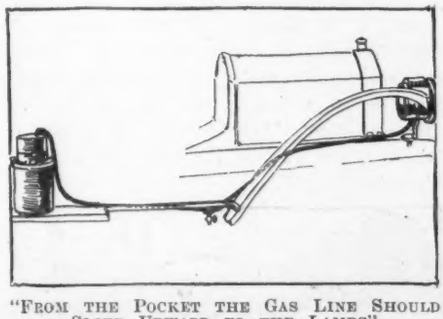
right angle position and become correspondingly less effective. In time they are pulled so straight as to be useless until new brake shoes or bands are supplied. When examining the brakes, therefore, it is not sufficient merely to see that the adjustment is taken up. It is also necessary to note the operative positions of the levers, bellcranks, etc.

Examining Lamp Generators

13—If trouble has been experienced from flickering of the gas lamps, the cause is almost certain to be found in incorrect arrangement of the piping. The latter should slope directly down from the generator to the lowest point of the system, at which a pocket should be provided to hold moisture carried over with the gas and condensed. From the pocket the gas line should slope continuously upward to the lamps if possible, and for a couple of feet at least in order to drain the moisture back to the pocket. If the gas piping is of the common soft copper variety of small diameter, good results cannot be expected from it, especially if it has sagged into a wavy line between its supports. For satisfactory service it is best to put in a substantial system of ⅛-inch—nominal—brass piping, properly supported and with sweated joints.

Recharge the Batteries

14—In charging the storage battery for the winter, each cell should be tested individually for both voltage and density of solution. The former should be 2.5 per cell, and the solution should test about 1,250 when the cells are fully charged. If the solution shows weaker on test, do not jump to the conclusion that more acid should be added until you are certain the cells are fully charged. An acid test of a half-charged cell means nothing. Many cells are injured by needless addition of acid.



"From the Pocket the Gas Line Should Slope Upward to the Lamps"

Thus far the subject of overhauling has been ignored. Nevertheless, in practice it is impossible to ignore it unless the car is so new and so well built that one knows without investigation that no work is required. In all probability something can to advantage be done. Whether or not it will have to be done in a shop is a question to be answered according to the ability, time and facilities of the owner. If it is settled that the car is to be shopped, the laying up processes will naturally be deferred until the car is returned, and items 5, 8, 9, 10, 11 and 12 are eliminated by the shop work, thereby greatly simplifying the whole proposition.

On the other hand, the owner who is his own boss and feels competent to instruct the shop exactly as to the desired scope of repairs, will wish to inform himself at some stage of the proceedings regarding the actual condition of the principal members of the car. In many particulars no exhaustive investigation will be required for this. If the radiator leaks or the cylinders do not hold compression, he is not likely to be in ignorance of the fact. If the engine knocks, familiarity with the symptoms of pre-ignition, crankpin looseness and worn valve mechanism will tell him with reasonable certainty the origin of the sound. If the steering gear is worn slack—and the steering gear is generally the first thing to wear out—a brief examination, while an assistant works the steering wheel or oscillates the front wheels to right and left, will show whether the looseness is in the reducing gear or in the links, and he can instruct the repair man accordingly.

To determine whether or not the gearshaft bushings and the bevel gears and differential are in good order is not so easy, but this is mainly due to the thick coating of oil or grease which generally conceals them. One may tell something by shaking the gear shafts and other parts, but if any looseness is discovered or if the gears are noisy, it is best to have the gear case and axle opened and the parts taken out and cleaned for examination.

A mechanically-inclined owner with some leisure time, a warm place to work, and a friend to help, can get a lot of fun out of overhauling his car during the cold months. Much of the work can be done in a well-lighted cellar if the garage is too cold. The transmission, steering gear and radiator can be dismounted and each attended to separately. Worn valve parts are replaceable with very little trouble. Cuts in the casing can be vulcanized while the other work is going on, and small repairs to the bonnet, mud guards, etc., can fill in odd hours when heavier work is not attractive. If the engine is small and the owner knows how to use a scraper, even the crankshaft bearings can be refitted; but this is not a job for the average owner. It is too easily bungled and too expensive when done wrong.

Legal Lights and Side Lights

MICHIGAN'S NEW LAW

THE new Michigan vehicle laws which will go into effect January 1, 1910, will have a number of changes and new features. Owners are especially affected by the changes. By the provisions of the new motor law all registrations will expire on December 31 of each year, and may be renewed at a cost of $1. The fee for new registrations has been increased from $1 to $3 per year. The purchaser of a second-hand machine must deposit $1 with the secretary of state and the person making the sale must report it to the same office within 10 days after selling it. Numbers shall be displayed conspicuously upon both the front and rear of the machine. The number must be of a different color from that of the car and must be attached so that it will not swing with the movement of the machine. Different colors of numbers and plates will be designated each year so it will be possible to tell at a glance which numbers are old ones. Under a new law it will be imperative for the driver of a vehicle which is obstructing the highway to turn out for a motor car. The driver of the car is required to use every precaution to prevent the frightening of horses and it becomes the legal duty of occupants of a car to render such assistance as he or she is capable to any driver of a team to prevent trouble. While the new laws recognize the power of townships and villages to regulate the speed of motor cars within their limits, it is stated distinctly that in no case must the speed limit exceed that of the state law—25 miles an hour in the country, 10 miles an hour in the business district of cities and 15 miles an hour in the residence districts of cities. Upon approaching a pedestrian or team in the highway the driver of a car must slow down to 10 miles an hour and give such warning as is necessary. There are a number of other changes in the new laws but they are of minor importance and do not affect the present laws enough to be worthy of special notice.

MOTORISTS HAVE RIGHTS

From Augusta county, Va., comes an interesting account of the trial of a case in the circuit court, which was appealed to the higher court, embracing features of general motoring interest. The suit is recorded as that of Baugher against Harman. The latter was hitching a horse which was being put into harness at Staunton when a motor car driven by Baugher came by. The horses became frightened and ran over Harman. The lower court gave him a judgment. Judge Whittle, of the supreme court, thinks the evidence did not show that the accident could have been prevented by Baugher, and that it is indicated that he was not aware of the danger until he was passing the scene. The court declared negligence was not established.

Of peculiar interest to the motorists of Virginia and to those who may travel through the state, is the opinion of the higher court which is cited. It says: "In the interest of public safety we fully appreciate the importance of a rigid enforcement of the law against the negligence in the operation of motor cars over the highways of the commonwealth. At the same time such conditions can afford no justification for mulcting the owners or drivers of such machines, whether with damage or fines, for inevitable accidents not due to their fault or negligence, yet to the happening of which they may have innocently contributed."

John Armstrong Chaloner, who has given the motor situation an especial study, requests that Virginia motorists give emphasis to the following statute, which is a digest of the state law:

"The owner, driver or occupant of any such motor car or machine shall keep a careful look ahead for the approach of horseback riders or vehicles drawn by horses or other animals and upon approach of such riders or vehicles shall slow up, give ample roadway to such rider or vehicle, and if signaled by such rider or occupant of such vehicle shall immediately bring his machine to a full standstill and allow ample room and time to allow such rider or vehicle to pass, and if requested so to do by the rider or occupant of said vehicle, the occupant of such machine, if a male, shall lead the horse or horses past the machine. Any person failing to perform any duty imposed by any section of this act or violating any provision or condition herein set forth shall for each offense be fined not less than $10, nor more than $100, or imprisoned in jail not less than 5 nor more than 30 days, or both, etc."

Mr. Chaloner recently well illustrated this law by holding a driver of a machine up at the point of a pistol and requiring him to lead past the machine a young colt which was being driven by Chaloner. Further, Chaloner publicly announced that he advised every driver of a horse to carry unconcealed a pistol or other weapon, to maintain the dignity of the law and for self-protection. This is the latest phase of the Virginia "Unwritten motoring law."

COMPILES STATE REGULATIONS

The Pennsylvania state highway department, in view of the fact that its new law, which incorporates the reciprocity feature, goes into effect January 1, has been compiling facts relative to the laws in other states and announces its findings as follows:

New Jersey—License good for 8 days, or four periods of 2 days each, issued for $1.
Delaware—Privilege for 10 days to licensed Pennsylvania motor cars.
New York—Exempt if laws of home state are complied with and tags displayed on rear.
Ohio—Exempt if laws of home state are complied with.
Indiana—Exempt if tag of home state is displayed.
Illinois—Exempt if tags of resident states are displayed front and rear.
Michigan—Reciprocal exemption, provided tag of home state is displayed front and rear.
Connecticut—Exempt for 10 days; revocable if convicted of violation of motor car laws.
District of Columbia—Exempt if state tag and credentials are displayed; other non-residents exempt if they register within 24 hours after arrival.
Massachusetts—Exempt for 7 days if tag of home state is shown.
Missouri—Exempt for 20 days if home state tag is displayed.
North Carolina—Exempt if passing through the state.
Rhode Island—Exempt for 20 days annually if home state tag is displayed.
Vermont—Exempt for 10 days if home tag is shown; after that owner must register in Vermont.
Maryland—Has no reciprocity law.

JOY-RIDING CHAUFFEUR PUNISHED

Harry Hackleman, a chauffeur of Indianapolis, has just been given the heaviest penalty ever exacted for joy-riding by an Indianapolis police court. While intoxicated Thanksgiving night, Hackleman ran his car into a cab, injuring two persons. This is what Judge Whallon of the police court gave him: Profanity, $1 and costs, amounting to $11; malicious trespass, for damaging the cab, $200 and costs, amounting to $210 and 60 days in the workhouse; malicious trespass, for damaging his employer's machine, $200 and costs, amounting to $210 and 60 days in the workhouse; fast driving, $50 and costs, amounting to $60; operating a motor vehicle while intoxicated, $1 and costs and 60 days in the workhouse. All together he will have to serve 682 days in the workhouse, unless he pays the fines.

CLUB NOW IN POWER

The secretary of the interior department of Hungary recently has made a decision which motorists in that country regard as significant. Hereafter all motor cars before getting their official permit will be examined by members or a technical committee as may be selected by the Hungarian Automobile Club. Whenever a car is to be tested or examined the club will advise the police department, which will have a representative there to follow the operations. Heretofore the club was consulted only by the police department. Now it is practically the reverse and the club has an official government standing.

The Motor Car Repair Shop

Hints for the Amateur

SAGGING and broken frames are becoming less numerous every day. This is owing to the stronger construction of the frame as a whole, and also to the more complete equipment of the cars by the manufacturer, with consequent care in the attachment of accessories. However, as broken frames, due to indiscriminate drilling of holes therein, still are to be seen in the repair shop from time to time, a few words on the subject may be of value to the young repairmen of the rising generation. First of all, when the attachment of accessories to the frame is contemplated, a means should be considered by which attachment may be made without the necessity of weakening or disfiguring the frame by drilling holes; if no such means may be conveniently used, and it will be necessary to make holes in the frame, great care should be exercised as to their size and location. In Fig. I, a side view of a channel steel frame is shown; the points A and B represent the support of the frame by the springs, and the points C represent the resting places of the weight which the frame supports. The stresses which exist under these conditions are shown in Fig. 2, in which E represents a section of the frame at and about the points A and B, the point G being the center of attachment; while F serves to show a part about the points C, with the point K the center of maximum weight. As for section E, it may be seen that the arrows in the lower portion of the frame converge, denoting a compressive stress, while those in the upper half diverge, indicating a tensile stress. The conditions are just the opposite in section F, where the strain tends to bend the frame downward at the point K. These stresses, which are almost nil near the center in the zone inside of the dotted lines drawn laterally across the sections E and F, increase as the top or bottom of the vertical side of the channel section is approached, and are greatest in the horizontal portions I and H. Therefore, if holes are necessary, they should be as small as possible and as near the center of the vertical section as convenient; and under all circumstances the horizontal portions should be most reluctantly bored, and if they must be bored, the holes should be as small and as near the center as possible. For example, in Fig. 1, two methods are shown of attaching the brackets for an acetylene gas tank, which is to be located almost amidships, under one of the side members of a channel frame. In this location, the internal stresses of the frame are probably greater than at any other place; and the tensile stress in the lower horizontal portion is very great; therefore, the practical man would attach his brackets by a single bolt in the center of the vertical section, as in sketch A, and the impractical method would be to make an attachment as shown in sketch B.

Oiling Up a Car

Keeping the motor and running-gear properly oiled is one of the main things to look after in the operation of a motor car, and many a good motor car has met an untimely fate for the want of proper lubrication. Ordinary lubricating oil must on no account be used for the lubrication of the cylinders. Much thought has been given the subject of cylinder lubrication, and a great deal of time has been spent by the large motor car factories experimenting along these lines, with the result that they have adopted and recommend the use of high-grade oils. Every part of a motor car which moves upon another part must have its quota of oil; and the best lubricating oil or grease is the one which, to the greatest degree, overcomes friction, and by overcoming friction reduces to a minimum the wear and tear of the working parts. In the past the springs, spring-shackles and brake and clutch mechanisms were the parts of a motor car most neglected. To overcome this, these parts are generously equipped with compression grease cups in the more modern cars. But even the most elaborate equipment of grease-cups is useless, unless the cups are refilled and turned down regularly. Negligent or improper lubrication is the source of many evils, and the result to the component parts of a machine are excessive wear, lost motion, lack of reciprocation, and finally destruction. Had Shakespeare been a motorist, he might have said, "All's well that's oiled well." The spark and throttle-control mechanisms come in for no little neglect in this respect, and poor reciprocation of these parts, especially of the throttle, robs one of much of the pleasure of driving. The end-bearings of the shafts which support the clutch and brake pedals are also often ignored, sometimes causing misalignment and dragging of the clutch, and the consequent grinding and difficulty when changing gears. Another prominent feature of a motor car which, although most conveniently located, is generally neglected, is the starting crank; the result is that it soon wears loose in its bearing and contributes a fair share of noise. There are many cars which will travel along a smooth asphalt pavement with the silence of night, but upon striking a cobble-stone pavement they will rattle like an artillery wagon. Much of this noise can be traced to the brake rod connections, which being inconveniently located, have become dry and worn for the lack of oil.

Uncommon Case of Ignition Trouble

Rather an uncommon case of ignition trouble occurred recently, which was due to a short-circuit in the switch. All wires and plugs and the magneto having been thoroughly tested, there was nothing left to test but the switch, and after removing a loose strand of wire therefrom the misfiring was eliminated.

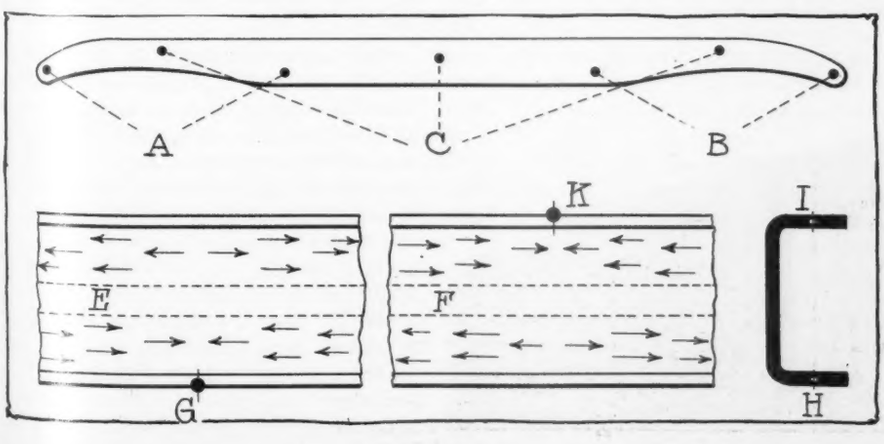


FIG. 1

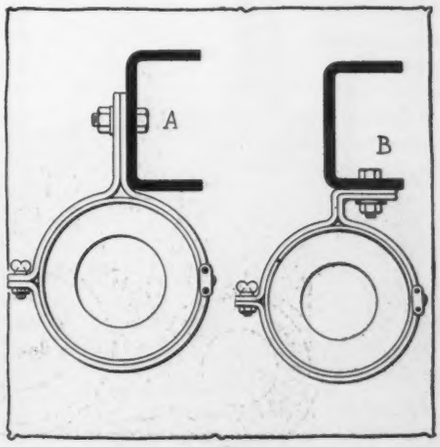


FIG. 2

Among the Makers and Dealers

Are Studebaker Agents—Van Wye & Hitchcock, of Warren, Ohio, have secured the Trumbull county agency for the Studebaker line.

Takes the Winton—The agency for the Winton for the states of Colorado and Wyoming has been taken by the Overland Motor Co. This company also handles the Overland, Apperson and Baker electric.

Pittsburg Show Committee—The committee recently appointed to take charge of the Pittsburg show at Duquesne garden, next April, has organized with Frank D. Saupp chairman, and James R. Newell, G. P. Moore and W. N. Murray as his helpers. The committee already is allotting space for exhibits.

Join M. and A. M.—The following concerns have been elected to membership in the Motor and Accessory Manufacturers: Auto Parts Mfg. Co., Batavia Rubber Co., Driggs-Seabury Ordnance Corporation, Excelsion Motor and Mfg. Co., Havoline Oil Co., Royal Equipment Co., Seamless Rubber Co., Warner Mfg. Co., Thermoid Rubber Co.

Duff a Manufacturer—Ralph Duff, of Nebraska City, Neb., has leased a site and will begin at once the erection of a factory to put on the market two patents which he has perfected. One is a new carbureter and the other is a device by which he can put pressure on acetylene tanks, insuring a steady light under all conditions.

Commercial Cars Its Specialty—The latest recruit in the motor car field at Baltimore is the Palace Motor Car Co., which has taken on the agency for a full line of Kline cars and will be the distributor for the state of Maryland. In addition to the various lines of pleasure cars, the firm will make a feature of commercial motor vehicles, being the first concern in Baltimore to take up this line on an extensive scale.

J. S. Ditch is president and Edward T. Boswell secretary and treasurer. The company has secured salesrooms at corner of Mount Royal and North avenues.

All Capital Subscribed—The full amount of the $100,000 capital of the Jonz Automobile Co. of Beatrice, Neb., has been subscribed and the company will at once begin the manufacture of cars. The Jonz is the invention of C. Charles Jones.

Garage for Electrics—G. A. Wilke, of Sheboygan, Wis., is remodeling the Journal building at Center avenue and North Seventh street into a garage, which will be the electric branch of his extensive garage business at Sheboygan. A complete recharging outfit will be installed in the branch.

Moving to Oklahoma—Arthur Fischer, W. H. Clark and James Worthington, until recently manufacturers of gasoline engines and motors at Manitowoc, Wis., have organized the Oklahoma Gas Engine Co., of Oklahoma City, and will build a large plant. The machinery in the Manitowoc plant is now being moved to Oklahoma.

Start Citizens' Company—McDonald Purcell, S. D. Pierson and William H. Stafford have organized and incorporated the Citizens Automobile Co. in Indianapolis and for the time being will conduct a repair shop and garage. Later a line of cars will be carried. The new company has leased quarters at 16 South Capitol avenue.

Is Subsidiary Concern—The Dakota Automobile Co., of Sioux Falls, S. D., has been incorporated under the state laws of South Dakota, with a paid-up capital stock of $10,000, the president being H. B. Groves, of Sioux City, Ia.; treasurer, J. B. Groves, of Sioux City, Ia., and the secretary, G. O. Jamesson, of Sioux Falls, S. D. The Dakota Automobile Co. will be operated as a direct branch of the Inter-State Auto and Supply Co., of Sioux City, Iowa. A new building has been erected for its occupancy, with a main floor space 44 by 150 feet, the basement 44 by 100 feet.

Weir a Ford Manager—The Ford Motor Co. has opened a branch in Pittsburg in the Rittenhouse block on North Highland avenue. F. E. Weir will be manager.

Joins Cole Forces—D. B. Sullivan, formerly owner of the Sullivan Automobile Co., Indianapolis, but more recently with the Indianapolis Automobile Co., has taken a position with the sales department of the Cole Motor Car Co. He is looking after the company's interests in Indianapolis.

Picks the Empire—The Columbus Garage and Machine Co., which has been operating a garage at 35 to 41 West Mount street, has taken the Columbus agency for the Empire. F. W. Luchtenberg is president and Charles R. Hambleton is secretary and treasurer. It is the first time the Empire has been represented in central Ohio.

Gets Fireproof Garage—The three-story, fireproof Hogan building in Indianapolis has been leased by the Reliable Auto Exchange, which recently was organized with an authorized capitalization of $25,000. The company will make a specialty of second-hand cars and also will do garage work. Those interested are John A. George, Roy Shaneberger and Oliver F. Shaw. William Wheeler has been appointed manager.

Lansing's Latest—The newest industry is the Auto Wheel Co. of Lansing, Mich., the organization of which has been perfected with E. S. Porter as president and manager. The company is capitalized at $150,000. The company is a reorganization of the Lansing Spoke Co. and has purchased the plant of that company, which will be increased, through the construction of new buildings, from a factory employing thirty men to one which will have 150 skilled mechanics on its payroll when completed.

Body Plant Growing—The Racine Mfg. Co., of Racine, Wis., builder of limousines, taxicabs, touring bodies, dashes, battery and tool boxes, coupes, piano stools, etc., is housed in its new buildings. The plant consists of nine buildings, with 500,000 square feet of floor space. Eight buildings are four stories high and the ninth and newest has six stories. The number of employes is 1,250 and 500 more are being added as they are procured. The plant covers 11 acres and the monthly payroll is in excess of $64,000. The factory is considered the largest and most complete plant of its kind in the world. The product is distributed by more than fifty con-

THERMOID RUBBER CO.'S NEW BUILDING AT TRENTON, N. J., DEDICATED TO MOTORING

cerns which make a specialty of wholesaling in parts and accessories. The company expects to erect several additional buildings during the winter.

Has Velie Besides Knox—The Conduit Automobile Co., of Indianapolis, which has the agency for the Knox, has closed a contract for the Velie state agency for 1910. The company recently located in motor row in North Delaware street.

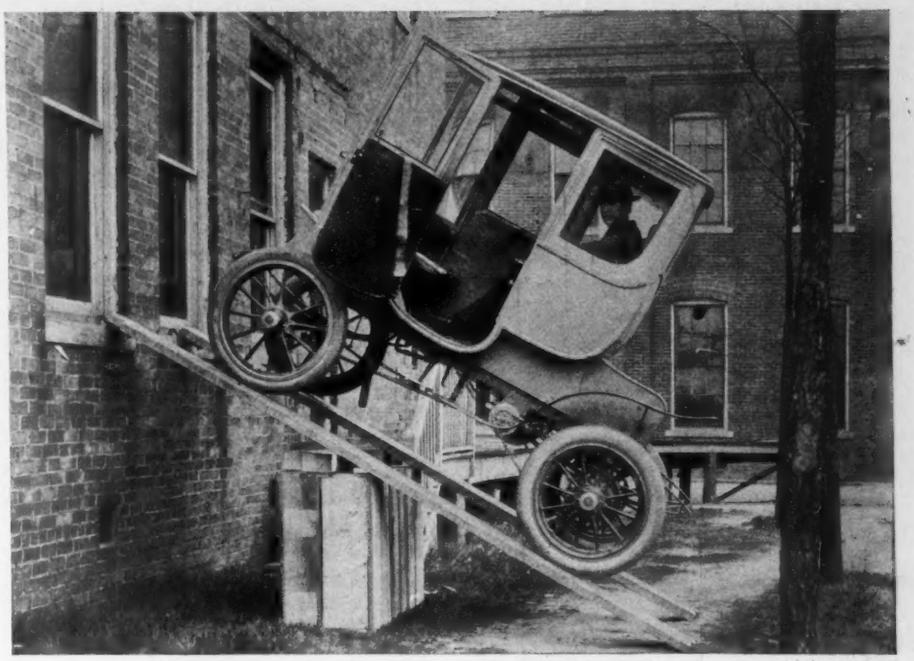
Gets Hub Representative—Andrew J. Pierce, designer of the Pierce-Racine car, has been making a tour of the east visiting the agencies where his car is being handled. He has been as far east as Boston, where an agency has just been established, with Volney Jacobs handling the car.

Leases Big Building—The Drummond Carriage Co. has leased the building on Farnam street formerly used as a garage for the White steamer to the Standard Automobile Co. Drummond will hereafter conduct his business under the same roof with his top manufactory and repair departments.

Change in Managers—The Electric Storage Battery Co. announces a change in management of its southern sales office. H. H. Seaman, the former manager, having resigned, A. N. Bentley has been appointed to take charge of this office. Mr. Bentley has had a comprehensive storage battery experience as the engineer of the Cleveland office.

Plum For Manitowoc—The Citizens' Association of Manitowoc, Wis., announces it has arranged with a large motor car supply and appliance concern to locate at Manitowoc, and a bonus of $10,000 already has been raised to provide a factory site and one building. The concern agrees to pay out more than $200,000 in wages annually for 3 years. The name of the concern is withheld for the present. Fifty-three leading business men have subscribed the bonus fund. The company's investment will total $100,000.

Philadelphia Changes—Wayne Davis, manager of the Philadelphia Matheson branch, has just returned from Detroit, where he landed the agency for the new Everitt 30 for eastern Pennsylvania, Delaware, Maryland and Virginia. Just what arrangements Mr. Davis and the Matheson people have made for the future representation of the latter's car in the Quaker City has not yet been disclosed. The Penn Automobile Co., 4212-18 Chestnut street, has just been awarded the Philadelphia agency for the Paterson 30. The Howard Demountable Rim Co., of Trenton, N. J., has opened a branch at 1411 Race street, with H. T. Eisenberg as manager. The Crawford Automobile Co., of Philadelphia, has been succeeded by the Hoopes Motor Co., with quarters at Broad and Fairmount avenue. The new concern, of which Henry R. Hoopes is the head, will take over the Crawford representation and in addition has acquired the Philadelphia agency for the Rambler, which up to a few weeks ago was represented in the Quaker City by the Tioga Automobile Co.



DEMONSTRATION OF EFFICIENCY OF DETROIT ELECTRIC BRAKES

Has the Black Crow—A. T. Wilson, of Denver, has taken the agency for the Black Crow, his territory being Colorado, Wyoming and Nebraska.

Secures the Anhut Six—The W. D. Huffman Automobile Co., of Omaha, has taken the agency for the Anhut six in addition to those it already has, the Inter-State, Hupmobile, Regal and De Tamble.

Sanger a Studebaker Manager—The Studebaker Automobile Co., of South Bend, Ind., has leased the entire first floor of the Colby-Abbot building, Mason and Milwaukee streets, Milwaukee, Wis., as a permanent location for the Milwaukee branch, temporarily established with the Sanger Automobile Co. at 572-574 Farwell avenue, 2 weeks ago. William F. Sanger will be manager.

Get the Detroit Electric—C. F. and J. R. Brown, now at 5143 Delmar boulevard, St. Louis, have taken the agency for St. Louis territory for the Detroit electric, and are having plans drawn for a two-story garage in the vicinity of their present location. The new garage will be equipped to charge electric cars as well as to accommodate the Peerless agency and to do a general garage business.

Tests Countershaft Brake—One of the features of the Detroit electric for 1910 is the countershaft brake, which operates on the far ends of the countershaft that transmits the power from the motor to the driving wheels. The Anderson Carriage Co. submitted the brake to a number of unique tests before deciding on its adoption for the 1910 cars. One of the tests was holding the car on a 45-degree slope. Planks were set up at that angle and the car drawn up on them, with a man in the operator's seat. The brake was set and held the car on the steep slope until released.

Truck Company Formed—The Reliable Auto Truck Co. has filed papers of incorporation in Buffalo. The capital stock of the concern is $20,000.

Milwaukee Agency Moves—The Akin Motor Car Co., of Milwaukee, Wis., agent for the Stevens-Duryea, has moved its salesrooms and garage from Fourth and Prairie streets to 482 Milwaukee street.

Capital Stock Increased—The Rauch & Lang Carriage Co., of Cleveland, O., maker of the Rauch & Lang electrics, has filed papers with the secretary of state increasing its capital stock from $250,000 to $1,000,000. The additional capital is to be used in making additions to the plant.

Washington Deals—The Regal agency in Washington, D. C., has been given to the Wilson Co., 1333 Fourteenth street, which also handles the American Simplex, Hupmobile, and Woods electric. The Belmont Garage Co. has secured the agency for the Brush runabout in Washington, D. C.

Longstreth Opens Branch—The Longstreth Motor Car Co., Pullman agent in Philadelphia, occupying temporary quarters at 1407 Race street until the completion of its new building at 257-259 North Broad street, has opened a branch at 912 Chestnut street, opposite the postoffice.

Adding to Plant—The Inter-State Auto and Supply Co., of Sioux City, Ia., is making a number of improvements. The one-story building at 609-611 Pierce street is being torn down and being replaced by a two-story building of the same dimension, 50 by 150. In addition, a small building adjoining the main property has been taken over and turned into a tire repairing, revulcanizing and retreading plant, which gives the company the only

GARAGE OF MULBERRY AUTO CO. AT MULBERRY, IND.

retreading plant between Omaha and Minneapolis. The company is devoting all of its time to wholesale business, distributing Reo, Maxwell, Regal and Thomas cars.

Making Acetylene Gas—R. G. and H. G. Oliver and W. B. Pearsall, of Pittsburg, have formed the Auto Acetylene Co. and will manufacture and sell acetylene gas in Pittsburg.

Fanning Mercer Agent—Frank Fanning, formerly connected with the Chalmers-Fanning Motor Co., Philadelphia agent for the Chalmers-Detroit, has closed with the Mercer Automobile Co., of Trenton, N. J., to represent the Mercer car in the Quaker City.

Occupies New Home—The Maxwell-Briscoe Boston Co. has moved into its new home at the corner of Massachusetts avenue and Newbury street. The company owns the entire building, but it will not occupy all of it at present. It has larger and better salesrooms now, and the location is just across the street from the other salesrooms, so Maxwell owners will have no difficulty in finding it.

Napier Deal Hangs Fire—C. A. Glenworth, who was one of the racing team of the Napier company in London, is now in Boston, where he is looking after the interests of that company. He has secured temporary offices at one of the Boylston street salesrooms. The deal whereby the Napier company of England was to take over the American company at Jamaica Plain has not been fully completed, apparently.

Moves in Baltimore—The Stearns is represented exclusively in the state of Maryland by the McMullen-George Automobile Co. of Baltimore. The company has opened for business with headquarters in Baltimore. It has extensive showrooms in the Academy of Music building, formerly occupied by the Ford Automobile Co. The Ford company has moved to its new garage and showrooms, North avenue near Oak street. The McMullen-George company has its garage and repair shop at 542 Tyson street. The officers of the company are Philemon H. Tuck, president; Dysart McMullen, treasurer, and C. H. Carter George, secretary and general sales manager.

Take the Maxwell—At Norwalk, O., A. W. Carpenter & Son have opened an agency and supply house and has become agent for the Maxwell. The store is located at 15 Maple street.

Will Make High-Wheeler—The Rogers Motor Car Co., of Omaha, which will begin business shortly, has been incorporated for $250,000 by Ralph Rogers, C. A. Overholt, C. A. Ralston, James Simmons and T. G. Travis. The company will manufacture a high-wheeler.

Enlarges Its Line—The Cook Motor Vehicle Co., of St. Louis, manufacturer of the Simplis buggy, is preparing to introduce a new small car, the Krit, in St. Louis. The Cook company has taken a long lease on the premises at 2755 Olive street, and was installed there last week. The building has 15,000 feet of floor space and is well suited for the manufacture and storage of motor cars.

Big Order for Engines—The Falls Machine Co., of Sheboygan, Wis., has received an order for 1,000 motors from a motor-car manufacturer at Detroit, Mich. The equipment will be greatly increased, and several tools for grinding crankshafts, pistons, piston rings and cylinders are being installed now. This is the largest order the company has been given since it made a specialty of engines for motor cars.

Big Garage for St. Louis—C. F. and J. R. Brown, retailers of the Peerless and Detroit electrics in St. Louis, have made a working agreement with the Park Automobile Co., which handles the Thomas, the Chalmers-Detroit and the Baker electric, for the erection of a large garage at Delmar boulevard and Clarendon avenue. The new garage, which already has been authorized by a city ordinance, is to be two or more stories high and equipped with every convenience for the caring of both gasoline and electric cars, including the charging of the latter. The Gardner Motor Car Co. will occupy the garage at 5143 Delmar, which the Browns are to vacate upon the completion of the new building.

Small Fire in Tire Plant—The Wisconsin Tire Repair Co., 186 Main street, Oshkosh, Wis., sustained a loss of about $500 by the explosion of a retreading pot in the vulcanizing plant.

Shelby Concern Incorporates—The American Motor and Supply Co. of Shelby, O., with a capital stock of $25,000, was incorporated with the secretary of state recently to operate a garage and sales agency. J. W. Williams is at the head of the concern.

Takes on the Parry—The Continental Motor Car Co., Inc., which handles the Speedwell in Philadelphia, and which is carrying on business in temporary quarters at 1425 Vine street pending the fitting up of the row quarters, has added the Parry car to its line.

Sells Appleton Garage—The garage of J. E. Stanton & Son, Appleton, Wis., has been purchased by Chester S. Scott and Harry Griffin, who have organized the Griffin-Scott Co. The building will be remodeled during the winter. The deal includes the Buick agency for Outagamie county, Wis.

Another for Toledo—Word is given out that Toledo will secure another important motor car concern in a short time, with a capital stock of $400,000 and furnishing employment to about 400 men. It will manufacture motor trucks. Officials of the company are expected in Toledo next week, when a formal announcement of details will be made.

Everitt Agents Organize—Motor car men from the eastern and western extremes of the country gathered in Detroit to take part in the final organization of the selling department of the Metzger Motor Car Co. The United States has been divided into fifteen sections and the representative in each is a stockholder in the parent company, something new in the industry. The morning session was at the factory and the afternoon was spent at school in the Pontchartrain. A dinner followed.

After Quaker Representation—Representatives of several factories whose cars are not handled in Philadelphia have been in the Quaker City recently looking for desirable agents. Among the new cars which will shortly put in an appearance there as a result is the Cole 30, handled in New York by the Colt-Stratton Co., eastern distributer, which concern is engineering the deal. Another car represented by the same Gotham house, the Paige-Detroit, will be also included in the arrangement. The Sinclair-Scott Co., of Baltimore, is endeavoring to close with a Quaker City representative for the Maryland car. J. C. Parker & Sons Co., of Middleton, Del., are seeking a Philadelphia representative for the Detroit electric. The Stoddard-Dayton Auto Co., of Philadelphia, has added the

Courier roadster to its line, President William P. Berrien having landed the agency during a recent trip to Dayton, where the Courier factory is located.

Has the Reliance Truck—The McDonald Automobile Co. of St. Louis has contracted for the agency for the Reliance truck. This company already has the agency for the Knox car.

Austin Agency Locates—The Austin agency that was taken recently in Boston by Evans & Warren is now located on Massachusetts avenue, near Boylston street. Business had been conducted from the garage in Newton, where the two men were in business.

Takes Two Agencies—The recently-organized Reliable Auto Exchange in Indianapolis has taken the 1910 Indiana agencies for the Continental 35 and Atterbury commercial vehicles. The company, which has leased the Hogan building in East Washington street, also will sell second-hand cars.

Modern Garage for Madison—George H. Pregler, of Madison, Wis., is building a new garage on West Johnson street, near Henry street, and expects to take occupancy about January 1. The garage is two stories high, with a high basement, 60 by 100 feet. The equipment includes a turntable and several modern hoists.

Many Lines for Norris—A. W. Norris, who recently accepted a position in the sales department of the Norris-Toledo Motor Sales Co., has returned from Indianapolis, where he closed a deal to handle the product of the American Motor Car Co. in Ohio, Indiana, Michigan and Kentucky. He also during the week closed a contract to handle the Gramm-Logan trucks, which will be sold in connection with the American, the Velie, Parry, and the Demot roadster.

Grossman's Prize Offers—The Emil Grossman Co., New York, has promoted a novel advertising contest in which eighteen cash prizes will be given to dealers throughout the country who give the best representations in their catalogs of Red Head spark plugs, Hydraulic and Spring-action windshields, Red Rib cable, Swivel-action bumper, Universal reel and Peugeot chains. Twelve prizes are offered for newspaper and theater program advertisements, six special prizes are offered to stimulate window trimmers to create ingenious displays of Red Head plugs, Hydraulic and Springaction shields during the holiday season, and twelve prizes are also provided for the best show window and store displays between January 1 and July 1, 1910. Prizes also are offered for novel ideas in window trimming during the period February 25 and March 10, which has been set aside to mark the inauguration of Red Head spark plugs, March 4. Two hundred and ninety-eight prizes are offered to traveling and store salesmen for the largest sales on the respective specialties manufactured by the Emil Grossman Co. Cartoons for show window displays, hangers, cards, catalogs, advertising matter and electrotypes will be furnished gratis to all who desire to participate in the contests.

In New Quarters—The Premier Sales Co., Ltd., which represents the Sterling, Premier and Reo cars in Pittsburg, has moved into handsome quarters at Beatty and Mignonette street.

New Firestone Agents—The following new distributing agencies have been established for Firestone tires and demountable rims: Whitaker Tire and Rubber Co., Memphis, Tenn.; Central Automobile Co., Vancouver, British Columbia; Harris Tire Co., Savannah, Ga.

Branch for Van Brunt—Henry H. Van Brunt, a pioneer implement and vehicle man of Council Bluffs, Ia., has arranged to open a motor car agency in Omaha in February, as soon as a new garage is built for his exclusive use. The new building will be of brick and concrete and construction will begin at once. J. Ostrander will manage the Omaha business.

New Company in Middle Georgia—A partnership composed of E. J. Willingham, Jr., and J. C. Wheeler, both of Macon, Ga., have opened a large modern garage in that city, doing all kinds of repair work, including steam vulcanizing. The firm goes under the name of Willingham-Wheeler Auto Co. and has the state agency for the Velie and Empire.

After More Show Space—In addition to securing the entire space in the Auditorium for the Omaha show in February, directors of the local association have taken steps to secure the buildings now being constructed adjacent to the Auditorium for the corn show. With more than a dozen dealers in Omaha than last year and with many more cars, the problem of the show will be to find sufficient space which was limited last year. If the corn show buildings can be secured, the problem will be solved and Council Bluffs dealers will then be invited to exhibit. Omaha now has thirty-three dealers and more are looking for locations. For the better handling of the big show, Omaha dealers have incorporated.

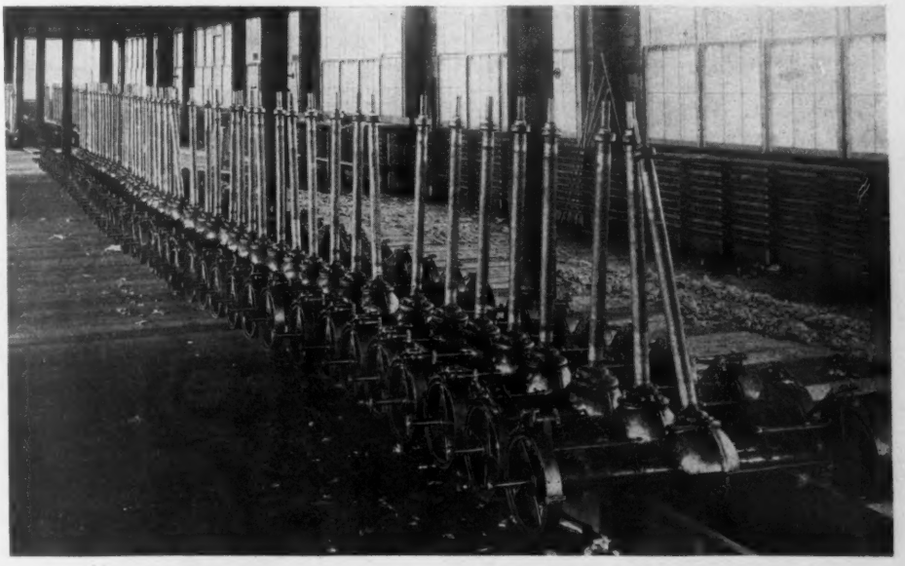
Handling Commercial Line—L. Glesenkamp Sons & Co. have secured the Pittsburg agency for the Martin department store wagon manufactured by the Martin Carriage Works of York, Pa.

Going Into New Place—The Maxwell-Briscoe Columbus Automobile Co., agents for the Maxwell in twenty-three counties in central Ohio, will move into its new sales rooms at 58 to 62 East Spring street, Columbus, about December 20. Frank Corbett is manager.

Hussey in New Deal—P. L. Hussey has resigned his position with Brandenburg & Co. and has associated himself with Fulton & Zinke, of Chicago, in a company to be known as the F-Z-H Parts Co., which will handle practically all the heavy parts of a car, such as motors, axles, transmissions, wheels, radiators, etc., and will be run in connection with the Fulton-Zinke company.

Putting Up Big Building—Plans have been submitted to the Indianapolis building inspector for the sales branch to be erected in that city by the Maxwell-Briscoe Motor Co. It will be a three-story brick structure, 40 by 125 feet, and will cost about $60,000. The building will be located at Illinois and Vermont streets and the first floor and basement will be ready for occupancy about February 1.

Car Plant at Akron—Plans are being perfected for the organization of a company for the manufacture of motor cars to be located at Akron, Ohio. O. V. Dibble, president of the Buckeye Match Co., will be president and general manager and C. R. Forth will be superintendent. S. E. Leonard, of Greenwich, Ohio, will be sales manager. Specifications have been prepared for a medium-priced roadster. It is the expectation to make 500 cars the first year and to employ 150 men.



STOCK OF REAR AXLES AT THE FACTORY OF THE PARRY CO., INDIANAPOLIS

From the Four Winds

N S E W

Hartford Bills Show—That Hartford, Conn., will have a motor car show this season is an assured fact, for at a meeting of the Hartford Automobile Dealers' Association a permanent show committee was appointed for the season of 1910 and the dates for the show set as February 14 to 19, inclusive. Fred W. Dart, E. G. Biddle and W. L. Ledger are the committee. Foot Guard hall will again be the scene of the show.

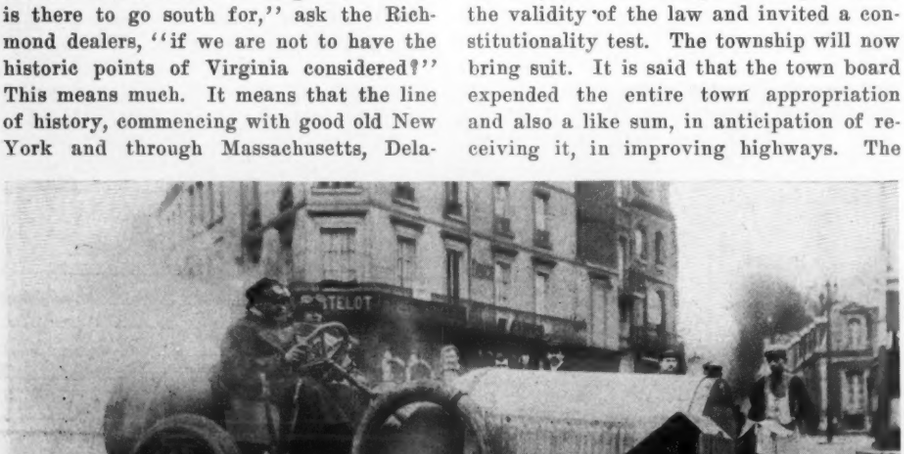
Makes Strenuous Trip—E. P. Blake, New England representative of the Jackson car, who recently made a run from Jackson, Mich., to Bangor, Me., with Charles G. Percival, to beat the old record made last spring, has recuperated from the effects of the exposure suffered on the run. His arms and face were much swollen and his body was a mass of aches. The tourists cut last year's mark by 2 days 12 hours and 45 minutes, establishing a new mark for continuous driving of 123 hours. The car contained 300 pounds of baggage and supplies, including 150 pounds of Monogram oil, fur robes, portable heaters, 100 feet of rope and tackle and extra gasoline tanks.

Waiting for Spring—Richmond, Va., is awaiting the passing of winter before commencing the greatest movement in the history of the state for better roads. There are added to the elect every day a goodly number of motor car owners. This means that the resolutions of the numerous organizations which have at heart the betterment of roads in the state will have advocates by the score. There are few states which demand more attention from the tourist element than Virginia. "What is there to go south for," ask the Richmond dealers, "if we are not to have the historic points of Virginia considered?" This means much. It means that the line of history, commencing with good old New York and through Massachusetts, Delaware, Virginia and the Carolinas is but an outlet to the points of greatest interest in the biggest country on earth. Virginia feels that it has been entered and passed without being approached.

Fights Narrow Tires—Saginaw county, Michigan, will head a movement in the next legislature to have enacted a law that will banish narrow-tired wagons. It will introduce, through its representatives, a bill which will specify the weights that may be carried on certain widths of tires. It also will specify the width of tire to be used and it is stated that this width will be generous. This, it is expected, will do much to preserve the roads of the state.

Convicts Do Good Work—W. E. Bibb, of Louisa, Va., the state's next assistant attorney general, who is a good roads enthusiast, was in Richmond the past week, and declared that about 4 miles of the road now being constructed in his county with the aid of the state convicts has been completed; that the work has been splendidly done and that the people are much pleased. The entire road is to be 6 miles in length, running from Trevillians to Poindexter's store.

Will Test Good Roads Law—A test of the good roads law passed by the Wisconsin legislature of 1909, providing that a town raising a certain amount of money for good roads purposes may claim and receive a like amount from the county, will result from the refusal of the county board of supervisors of Walworth county, Wisconsin, to accede to the demands of the township of Whitewater. The township raised $1,000 and asked for a like amount, but the county board questioned the validity of the law and invited a constitutionality test. The township will now bring suit. It is said that the town board expended the entire town appropriation and also a like sum, in anticipation of receiving it, in improving highways. The highways that have been improved include all of the roads selected by the Wisconsin State A. A. as proposed courses for the next Cobe trophy race under the auspices of the Chicago Automobile Club.



HEMERY IN BENZ WHICH BROKE BROOKLANDS RECORDS

Road Bill Drafted—The Wisconsin legislative committee on good roads has completed a rough draft of the bill to be introduced at the special session of the legislature in January. The main features, it is intimated by members of the committee, are: Providing for a good roads commission of three men to supervise the state's share of highway improvement; providing for an equal distribution of the cost of improving and building highways among the state, county and township, one-third to each; providing for the extension of state aid for earth and dirt roads in counties having a population of 25,000 or less.

Odenbrett Was a Pioneer—George L. Odenbrett, member of the Bates-Odenbrett Automobile Co., Wisconsin agent for the Buick and Winton, whose untimely death was reported in Motor Age last week, was considered one of the best and most experienced motor car men in the west. He was one of earliest racing drivers in Wisconsin, and besides having the distinction of being the first motor car owner in the state he also was the builder of the first car. Some time before the Winton company produced its first cars Mr. Odenbrett, an expert mechanic, constructed a rude self-propelled vehicle, which he discarded upon purchasing a Winton. He was the inventor of several important appliances, the latest being a self-starting device that has been adopted by a leading manufacturer.

Motor Course of Shells.—A motor course built entirely of shells and covering practically 10 miles in length is the project of Harvey D. T. Wilson, chairman of the good roads committee of the Automobile Club of Houston and also of the Business League of Houston. Mr. Wilson owns a tract of Texas land of about 3,000 acres, located about 25 miles south of Houston at the town of Webster, which town is connected with Seabrook and LaPorte, both on Galveston bay, by means of country roads only. By connecting Webster with Seabrook, a distance of 6 miles, and building northward to LaPorte, for about 3 or 4 miles, a triangular course would be formed by utilizing the county road, which is now shelled from LaPorte to Webster. Mr. Wilson contemplates cutting the corner, giving them the proper curve and elevation, placing the track in ideal condition. This track will be connected with both Galveston and Houston by shell roads, now under course of construction, and is, by far, the most important move toward

the betterment of roads in the southern part of the state. Mr. Wilson also contemplates building from Webster to Seabrook an interurban line, installing a motor car service, and utilizing this land in bringing his shells from the sea shore.

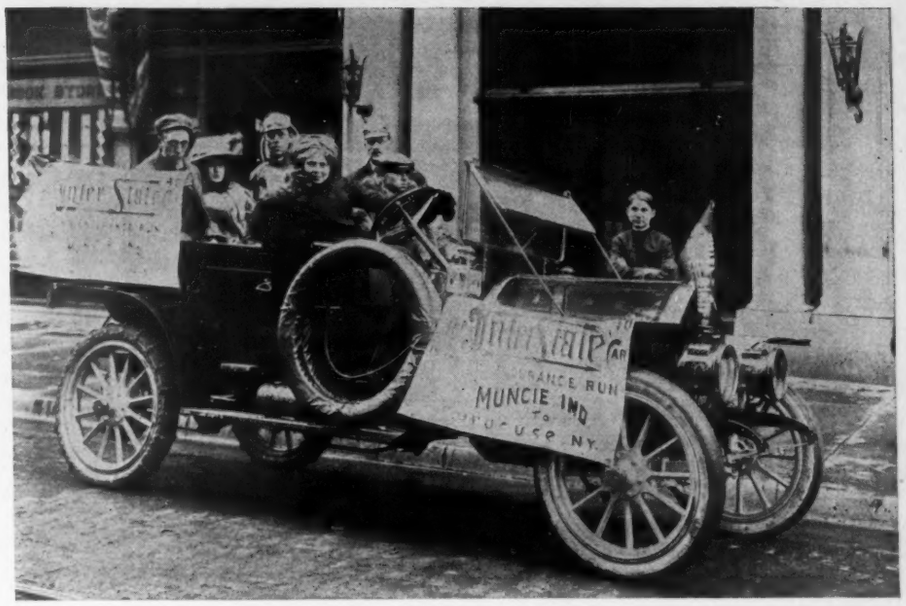
Woman On Long Trip—Mrs. George J. Arnold, of Syracuse, N. Y., recently distinguished herself by driving an Inter-State touring car from the factory at Muncie, Ind., to her home in Syracuse—1,000 miles in 5 days.

Tire's Birthday—English motorists celebrated the twenty-first birthday of the pneumatic tire by giving a monster banquet in London on November 19, which was attended by many prominent European motorists and which was presided over by Prince Francis, of Teck.

Point for the Rambler—The Chicago and Milwaukee Electric Railroad Co. has been denied a new trial in the suit brought by Thomas B. Jeffery & Co. for $2,000,000 damages resulting from cutting a right of way through the real estate owned by the Rambler concern. A verdict of $133,000 damages was awarded recently to the Jeffery company. This was the second trial, the state supreme court having ordered a retrial of the first case on the claim that the verdict of $135,000 then rendered was too high. Another appeal will be taken.

Galveston Has Good Beach—According to Barney Oldfield, the beach at Galveston, Tex., has racing possibilities not exceeded by any other beach course in the country. He was in Galveston a few days ago and after trying out the beach said: "Galveston certainly has a great beach, and I can't see why it has not been taken advantage of before this for speed trials. I covered about 8 or 10 miles of the beach and I believe that with a little attention a great course could be put in shape for record trials that would smash some of the standing marks."

Rivalry Over Shows—Preparations go on merrily, though with a bit of rancor, for the two Kansas City motor shows. The Motor Trade Association which has a show in Convention hall the week of January 17 has established headquarters in the Midland building and begun an earnest campaign for patronage. The show the week of February 28 also in Convention hall is promoted by the old Kansas City Automobile Dealers' Association and will have the advantage of a greater variety of cars, the old association having fifty members against the sixteen in the new organization. The committee directing the first show consists of W. S. Hathaway, chairman; R. H. Collins, J. Frank Witwer, Fletcher Cowherd, Jr., C. C. Meade, E. P. Moriarty and W. H. McGee. The committee of the old association is a flying squadron of twenty-five members headed by E. M. Hollister, chairman. So many cars are to be exhibited at the late show that it is proposed to build a secondary arena over the boxes and part of the balcony to accommodate all of the members of the association. There are just about sixty spaces in the hall under old arrangements, and unless the addition is built, all of the exhibitors will be restricted to one lot, which will be a great objection.



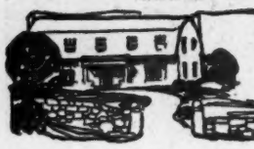
MRS. GEORGE J. ARNOLD DRIVING INTER-STATE FROM MUNCIE, IND., TO SYRACUSE, N. Y.

Will Include Aeroplanes—The outlook for the motor car show to be given in Convention hall, Washington, D. C., during the week of January 24-29, is very roseate, particularly as it has been decided to have a large exhibit of aeroplanes in connection with the show. B. R. Johnson, who has been selected as manager of the show, has held the drawing of space. It was decided to make the inside spaces eighteen in number, and charge $200 each for them, while the outside spaces, about thirty in number, will cost $100 each. The decorations and lighting effects will be uniform and will be furnished by the show committee. Chairman Long was authorized to increase the number of this committee from five to ten members.

Prepare For Road Campaign—That the Ohio Good Roads Federation, which soon will remove its headquarters from Cleveland to Columbus, will take a prominent part in highway legislation before the next session of the general assembly is assured. The legislative committee of that organization, realizing the need of amending the present statutes, has prepared a bill to remedy the defects of the present law in the opinion of the federation. The bill seeks to lay out a plan of systematic improvement of the highways and for that purpose provides for a board to be appointed by the governor and whose duties it will be to designate the relative importance of all the highways of the state. After this work has been done all improvement, either by state aid or through local effort, must be done in the order of the board's designation and under the supervision of the state highway department. The proposed bill also provides for improvement of highways under county or township aid and also for a competent staff of engineers and experts to be attached to the state highway department, to be at the call of every community in the state. Provision is also made for perpetual maintenance of improved highways.

New Year's Test Off—The Quaker City Motor Club's contest committee, after thoroughly canvassing the situation, has decided to abandon its New Year's reliability run. This annual Philadelphia fixture has tested the endurance of drivers, observers and passengers more than that of the competing cars, the number of clean scores having on several occasions necessitated run-overs to decide the winner. The Century Motor Club has jumped into the breach with a 1-day roadability run, scheduled for New Year's day, over a 150-mile course, including in its itinerary Wilmington, West Chester, Oxford, Chester, Media, Phoenixville, Norristown and Doylestown.

Nashville's Problem—An unusual problem confronts motorists in Nashville, Tenn., and one for which there seems to be no remedy. Nashville is known as the Rock City and the reason for it is because solid rock is found for miles around not over 4 or 5 feet under the surface. This rock is used in building the streets. It is limestone and passing vehicles gradually grind it into a very fine dust. Keeping down the dust long was a problem for the city, but for several years now it has used dozens of sprinkling wagons. Some of the up-town streets are sprinkled as much as four times daily and even those in the suburbs are drenched twice daily. This keeps mud all over the city most of the time and it is a slippery and dangerous mud. Motorists do not want to at all times use chains, but even the most careful of them skid some.



News from the Motor Clubs

Denver's Card—That the activities of the Denver Motor Club for the coming year may be well known before time and to avoid conflictions the officials of the club have announced the following contests: Two road races, one on Decoration day and the other on Labor day; a reliability contest in June; a gasoline economy contest in October, and a hill-climb in November.

Chicago Motor Club Election—Officers for the ensuing year have been elected by the Chicago Motor Club as follows: President, David Beecroft; first vice-president, Thomas J. Hay; second vice-president, Louis Geyler; secretary, Frank H. Trego; treasurer, Harry T. Clinton; directors, C. G. Sinsabaugh, Oliver G. Temme, Charles E. Gregory, Edward A. Hearne and Joseph P. Frisby; auditing committee, Harry W. Cooper, N. H. Van Sicklen, Jr., and G. S. Chapin.

After the Road Supervisors—As good as its word, the good roads committee of the Lancaster Automobile Club, of Lancaster, Pa.. has taken the bull by the horns in dealing with shiftless and inefficient road supervisors of Lancaster county. Attorney Charles G. Baker, solicitor for the club, has taken the matter into the November term of quarter sessions court and has filed exceptions to the return on four of the forty townships of the county. The four guilty ones are Eden township, Penn, Manheim and Lancaster townships.

Working for Roads—The Denver Motor Club is beginning to outline its work for next year and it will be noticed that one of the principal features will be the securing of better road conditions. It has been decided that a good roads meeting will be called for the very near future to which the county commissioners, the board of public works, the Denver Real Estate Exchange, the chamber of commerce and similar bodies will be invited, as well as a press committee from the different publications throughout the state. The general public little realizes what poor roads cost the country, and that it may be enlightened on this subject the motor club has secured a copy of a report on relation to the public roads to the farmer. This report contains many interesting facts and figures. The federal department of agriculture from time to time gives interesting and striking information on the cost of better roads. From one of these bulletins it will be seen that the cost of hauling a ton of products 1 mile on the country roads is on the average of 25 cents. Stone roads in good condition reduce the cost to 8 cents, dirt roads in bad condition necessitate an expense of 39 cents, wet sandy roads 33 cents and dry sandy roads 64 cents. It is estimated that about $250,000,000 would be saved annually by reducing the cost to 12 cents per ton per mile.

Organized at Norwich—At Norwich, N. Y., recently the Chenango County Motor Association was formed. Among the officers of the organization are the following: President, Henry R. Follett; vice president, Frank S. Powell; treasurer, H. Gilbert Mahan; secretary, Charles H. Latham.

Club at Tampa—The St. Petersburg and West Coast Automobile Club has been organized at Tampa, Fla., with the following officers: President, Dr. F. W. Wilcox; vice-president, E. T. Lewis; secretary, A. W. Fisher; treasurer, Horace Williams. A board of governors has been elected and the club formally organized.

Club Doing Good Work—The executive committee of the Colorado Springs Automobile Club is seeking ways and means to advance the joys and lighten the loads of motorists, and it has decided to send out a wagon after every windstorm to gather up broken glass, nails, rubbish, etc., thereby minimizing the possible damage to tires. The committee also has taken preliminary steps toward reducing the steep grade of Jones' hill on the Broadmoor road.

Social Time in Buffalo—Members of the Automobile Club of Buffalo will hold their annual meeting and election of officers on Tuesday evening, December 21. An entertainment will follow the business session. H. G. McComb, chief engineer of the E. R. Thomas Motor Co., gave an illustrated lecture before the club Monday evening on "Designing the Motor Car." Pictures of the grand prix race of 1909 and the Vanderbilt cup race also were shown. The membership of the Buffalo club is rapidly increasing. Sixty-one new members were received in November and eighty-five in October.

Novel Recruiting Campaign—The Louisville Automobile Club of Louisville, Ky., has just concluded a most successful membership campaign. Each prospective member was sent a regular legal summons such as is used in civil actions in the circuit court of Kentucky. This summons, after reciting in its preamble that this action had been filed by the Louisville Automobile Club against this prospective member, cited him to appear and stand trial on a certain day. This naturally excited interest and as he read on, the plan unfolded itself. In nine cases out of ten the reader took the trouble to call on the secretary and a very large percentage did as the summons directed and sent the $3 to the treasurer. Eighty-five new members were received, raising the total membership to over 350.

Club Building a Garage—The Country Club of Virginia, about one-half of the membership of which are owners of cars, is now preparing to erect a garage. The club is situated about 5 miles from the city of Richmond and affords one of the most charming resorts in the vicinity for tourists.

Club Paper in Syracuse—At a recent meeting of the Automobile Club of Syracuse, of Syracuse, N. Y., it was decided to issue a monthly publication which shall be devoted to the interests of the club and the dealers of the city and vicinity. The new publication is to be known as the Spark Plug, and the first number will appear about January 1. It is to be used largely as a medium through which to keep the members posted on the activities of the motor world principally with reference to new legislation as it is introduced from time to time.

New Maryland Club Officer—J. B. Hutchinson has been named as assistant secretary of the Automobile Club of Maryland. He will look after all the active work and in that way relieve Secretary Frank Darling of many of the duties that have heretofore fallen to him. The road signs committee of the club reported progress in their work, stating that the work of equipping the roads leading out of Baltimore with these signs is almost finished. Many of these signs have been placed along the Annapolis pike, Belair road and Edmondson avenue road.

Boston Chauffeurs Organize—The first step toward eradicating the evils of joy riding and reckless driving through the medium of the drivers themselves, was taken in Boston when about 200 chauffeurs met at the motor mart and formed an organization to be known as the Chauffeurs' Protective Association. The plan is to get all the best drivers in the state as members of the organization. J. E. Connor was chosen temporary chairman with power to call another meeting shortly. An effort was made to get Police Commissioner O'Meara or some member of the police department to attend the meeting and talk things over, but it failed. The organization will have a fund whereby members will be protected when arrested, and the organization will stand back of anyone who is unjustly charged with an offense. It will affiliate with other organizations and try to get drivers in other states to organize along similar lines.

Brief Business Announcements

Brooklyn, N. Y.—H. G. Martin has just been appointed agent for the Inter-State.

Boston, Mass.—Palmer & Singer have opened a branch in this city at 49 Fairfield street.

Lansing, Mich.—The Watt Motor Co., of Detroit, has been incorporated with a capital stock of $100,000.

Harrisburg, Pa.—The Charleroi Auto Co., of Charleroi, has been incorporated with a capital stock of $10,000.

Richmond, Va.—The City Taxicab Co. has been incorporated with a capital stock of $10,000, to operate motor cars and taxicabs.

Atlanta, Ga.—Grayson Heidt, who has been appointed agent here for the Pullman, has opened for business at 10 Auburn avenue.

Kansas City, Mo.—The Midland Motor Car Co. expects to be permanently located in its new home on Grand avenue before the end of the week.

Portland, Ind.—A company to manufacture bodies and body parts is in process of organization here. The concern will have a capital of $250,000.

Trenton, N. J.—The Demotocar Co. of New Jersey has been incorporated with a capital stock of $1,000,000 and will engage in the manufacture of motor cars.

Seattle, Wash.—E. M. Biehl, manager of the Western Auto Sales Co., has secured the agency for the Middleby car. He is temporarily located at 1111 American Bank building.

Philadelphia, Pa.—Application will shortly be made for a charter for a new concern to be known as the W. Wayne Davis Co., which is to deal in, manufacture and repair cars, and handle supplies, parts and sundries.

Philadelphia, Pa.—Application is to be made for a charter for a new corporation to be known as the Olds-Oakland Co. of Pennsylvania, Inc., which will manufacture and deal in motor cars, trucks, boats, aeroplanes and supplies of all kinds.

Atlanta, Ga.—The Dixie Auto Sales Co. has been incorporated with a capital stock of $5,000 by G. A. Bradley, F. M. Payne and J. F. Bristow. The Atlanta Motor Agency, of 91 North Pryor street, has been appointed local representative for the Austin.

Atlanta, Ga.—The Ohio Motor Car. Co., of Cincinnati, has just closed a contract with the Georgia Automobile Co., of Forsyth, and the latter concern is to act as agent in this state for the Ohio car. Senator S. Rutherford is president of the company, and Congressman E. F. Hill, also of Forsyth, is secretary and treasurer. The Georgia Automobile Co. is planning to open a branch in Macon and also one in Atlanta.

Detroit, Mich.—The Gray Motor Co. has increased its capital from $100,000 to $250,000.

Farmington, Mo.—The Kingston Auto Co. will represent the Studebaker in St. Francois county.

Harrisburg, Pa.—The Auto Merchandise Co., of Pittsburg, has been incorporated with a capital stock of $10,000.

Utica, N. Y.—The Packard Motor Car Co. is for the present located at 126 Lafayette street, corner of State, until its new garage is completed.

Pittsburg, Pa.—The Keystone Automobile Co., which is one of the oldest agencies in the city, has added the Overland to its list for the coming season.

New York—The Van Auken Motor and Machine Works, with offices at 108 Wall street, and a plant at Bridgeport, Conn., has filed a petition in bankruptcy.

Harrisburg, Pa.—Charles Ensminger has opened a garage at Green and Cumberland streets. The floors are of concrete, and the building will accommodate as many as 100 cars.

Durant, Okla.—The Durant Motor Co., of this city, has been appointed agent in this city for the Studebaker Automobile Co., and will have the agency in four contiguous counties.

Ilion, N. Y.—At the recent meeting of the board of trade a communication from the Cincinnati Rubber Tire Co. was received, asking as to the advantages of this town as a site for a plant. The company has not yet decided to move, but the business is increasing so rapidly that it will be obliged to enlarge its plant very soon.

Boston, Mass.—An agency has been opened at 16 Columbus avenue, in the motor mart, for the Croxton-Keeton car.

Baker City, Ore.—E. M. Chandler, owner of the only garage in this city, has taken the agency for the White steamer there.

Albany, N. Y.—The Mears Auto Co., of Brooklyn, has been incorporated with a capital stock of $12,000 by John W. Mears, E. I. Kellam and M. B. Hatch.

Houston, Tex.—J. F. Sigmond has been appointed agent here for the Hupmobile and for the present will make his headquarters at Rusk and Louisiana streets with the Palace Automobile Co.

Cleveland, O.—The Motor Supply Agency Co. has enlarged its offices, and now has a special department devoted to the Empire tire. It now has an arcade running from Euclid avenue to Huron road.

Tacoma, Wash.—One of the finest and most completely equipped salesrooms in the city has within the past week been established by the Winton at 705 Pacific avenue. Detweller & Rushmore are the Tacoma agents.

Walla Walla, Wash.—Gasoline motor car service has been established between Dayton and Wallula via Walla Walla. The service has been contended by commercial organizations along the route for several years.

New York—A. B. Cordner, who was formerly the head of the A. B. Cordner Co., has been appointed local manager of the Rapid Motor Vehicle Co. and is to open an office at Broadway and Sixty-fourth street during the coming week.

Akron, O.—C. W. Moody, who has been branch manager of the Pennsylvania Rubber Co., of Cleveland, and later with the Chicago branch of the same concern, has been appointed sales manager of the reorganized Firestone Tire and Rubber Co., of this city.

Oklahoma City, Okla.—The Dixie Motor Car Co., of Guthrie, has been incorporated with a capital stock of $100,000 and will shortly establish a factory here. Among those interested are R. C. Bennett, T. H. Lindsay and O. K. Sutton. They are to manufacture motor buggies.

Oregon City, Ore.—Todd E. Binford has bought the old Standard Machine and Mfg. Co., and in the future it will be known as the Oregon City Machine Works. The plant is to be remodeled and improved, and in addition to doing a general machine business, particular attention is to be paid to motor cars.

Augusta, Me.—Cushnoe Motor Co., capital stock $100,000; to manufacture engines of all kinds. Incorporators, E. F. Noble and C. J. Jackson.

Orange, N. J.—Woolston Co., capital stock $50,000; to deal in motor cars, parts and accessories. Incorporators, J. D. Woolston, E. V. Brann and H. N. Smith.

Buffalo, N. Y.—B. & P. Motor Car Co., capital stock, $1,000; to manufacture and deal in motor cars and accessories. Incorporators, F. J. Brodie, J. A. Brodie and Mary G. Parkhurst.

Camden, N. J.—Atlantic Automobile Supply and Exchange, capital stock $125,000; to deal in and repair motor cars. Incorporators, F. W. Renwick, H. W. Wiggins and Victor D. Renwick, Jr.

Norfolk, Va.—Tidewater Automobile and Garage Co., capital stock $15,000; to engage in a general motor car business. Incorporators, C. P. Weston and G. F. Burke.

Roanoke, Va.—Virginia Motor Car Co., capital stock $25,000. D. W. Persinger is to be the president of the new corporation and W. P. Crumpacker, vice-president, while James Frantz is to act as secretary and treasurer.

OFFICIAL LIST OF A. L. A. M. SHOW EXHIBITORS

MAIN FLOOR

1—Elmore Mfg. Co.
2—Everitt-Metzger-Flanders Co.
3—Studebaker Automobile Co.
4—F. B. Stearns Co.
5—Knox Automobile Co.
6—Columbia Motor Car Co.
7—Autocar Co.
8—Corbin Motor Vehicle Corp.
9—Matheson Motor Car Co.
10—The Pope Mfg. Co.
11—Lozier Motor Co.
12—Locomobile Co. of America.
13—American Locomotive Co.
14—Packard Motor Car Co.
15—Pierce-Arrow Motor Car Co.
16—Cadillac Motor Car Co.
17—Chalmers-Detroit Motor Co.
18—E. R. Thomas Motor Co.
19—H. H. Franklin Mfg. Co.
20—Winton Motor Carriage Co.
21—Stevens-Duryea Co.
22—Peerless Motor Car Co.
23—Buick Motor Co.

ELEVATED PLATFORM

24—Selden Motor Vehicle Co.
25—Willys-Overland Co.
26—Hewitt Motor Co.
27—Royal Tourist Car Co.
28—Mercer Auto Co.
29—Olds Motor Works.
30—Haynes Automobile Co.
31—Waltham Mfg. Co.
32—Hudson Motor Car Co.
33—Apperson Brothers Automobile Co.

EXHIBITION HALL, MADISON SQUARE FRONT

50—Woods Motor Vehicle Co.
51—S. R. Bailey & Co., Inc.
52—The Waverley Co.
53—Babcock Electric Carriage Co.
54—Columbia Motor Car Co.
55—The Baker Motor Vehicle Co.
56—The Anderson Carriage Co.
57—The Rauch & Lang Carriage Co.
58—Studebaker Automobile Co.

BASEMENT, COMMERCIAL VEHICLES

75—Knox Automobile Co.
76—E. R. Thomas Motor Co.
77—Studebaker Automobile Co.
78—Baker Motor Vehicle Co.
79—H. H. Franklin Mfg. Co.
80—American Locomotive Co.
81—The Autocar Company
82—General Vehicle Co.
83—Packard Motor Car Co.
84—The Pope Mfg. Co.
85—Alden Sampson Mfg. Co.
86—Hewitt Motor Co.

ELEVATED PLATFORM, ACCESSORIES

100—B. F. Goodrich Co.
101—Diamond Rubber Co.
102—C. F. Splitdorf
103—Goodyear Tire and Rubber Co.
104—Atwater Kent Mfg. Co.
105—G & J Tire Co.
106—Gray & Davis
107—Pennsylvania Rubber Co.
108—R. E. Dietz Co.
109—Cramp & Sons
110—Baldwin Chain and Mfg. Co.
111—Phineas Jones & Co.
112—Light Mfg. and Foundry Co.
113—Jones Speedometer
114—Conn. Telephone and Elec. Co.
115—C. A. Mezger
116—Weed Chain Tire Grip Co.
117—N. Y. and N. J. Lubricant Co.
118—Republic Rubber Co.
119—National Carbon Co.
120—Ajax-Grieb Rubber Co.
121—Hartford Suspension Co.
122—Empire Tire Co.
123—R. E. Hardy Co.
124—Janney-Steinmetz & Co.
125—J. H. Sager Co.
126—American Ever-Ready Co.
127—Auto Improvement Co.
128—Witherbee Igniter Co.
129—Globe Mach. and Stamping Co.
130—Leather Tire Goods Co.
131—Coes Wrench Co.
132—Cook's Standard Tool Co.
133—Hoffecker Co.
134—Edmunds & Jones Mfg. Co.
134A—Fox Metallic Tire Belt Co.
135—C. Cowles & Co.
136—Continental Rubber Works
138—Motz Clincher Tire and Rubber Co.
139—Duff Mfg. Co.
140—A. W. Harris Oil Co.
141—Firestone Tire and Rubber Co.
142—Oliver Mfg. Co.
143—Timken Detroit Axle Co.
144—Timken Roller Bearing Co.
145—Warner Instrument Co.
146—Motsinger Device Mfg. Co.
147—Randall-Faichney Co.
148—Byrne-Kingston & Co.
149—Spicer Universal Joint Mfg. Co.
150—Pittsfield Spark Coil Co.
151—Whitney Mfg. Co.
152—Brown-Lipe Gear Co.
153—Swinehart Clincher Tire Co.
154—Warner Gear Co.
155—American Ball Bearing Co.
156—Standard Welding Co.
157—Badger Brass Mfg. Co.
158—A. R. Mosler
159—Gabriel Horn Mfg. Co.
160—Joseph Dixon Crucible Co.
161—Heinze Electric Co.
162—C. T. Ham Mfg. Co.
163—Valentine & Co.
164—Adam Cook's Sons.
165—Briscoe Mfg. Co.
166—Gilbert Mfg. Co.
167—Vacuum Oil Co.
168—Atwood-Castle Co.
169—Herz & Co.
170—S. F. Bowser & Co.
171—Springfield Metal Body Co.
172—Michelin Tire Co.
173—Remy Electric Co.
174—Consolidated Rubber Tire Co.
175—Stewart & Clark Mfg. Co.
176—Wheeler & Schebler.
177—Continental Caoutchouc Co.
178—Fisk Rubber Co.
179—Veeder Mfg. Co.
180—Morgan & Wright
181—Diamond Chain and Mfg. Co.
182—Hartford Rubber Works

BALCONY

200—Elec. Storage Battery Co.
201—C. A. Shaler
202—Link Belt Co.
203—High-Wheel Auto Parts.
204—Noera Mfg. Co.
205—Havoline Oil Co.
206—Warner Mfg. Co.
207—Batavia Rubber Co.
208—Driggs Seabury Ordnance Corp.
209—Charles E. Miller
210—Sireno Co.
211—Champion Ignition Co.
212—Keystone Lubricating Co.
213—Perfection Wrench Co.
214—R. I. V. Co.
215—Jeffrey-Dewitt Co.
216—Thomas Prosser & Sons.
217—Eastern Carbon Works
218—Simms Magneto Co.
219—Isaac C. Johnson & Co.
220—L. J. Mutty Co.
221—H. H. Franklin Mfg. Co.
222—High Frequency Ignition Co.
223—S. Hoffnung & Co., Ltd.
224—Peter A. Frasse & Co.
225—Lavalette & Co.
226—J. S. Bretz Co.
227—George A. Haws.
228—K-W Ignition Co.
229—Morrison-Ricker Mfg. Co.
230—N. Y. Sporting Goods Co.
231—Carpenter Steel Co.
232—Pierson Motor Supply Co.
233—Ernst Flentje
234—Allen Auto Specialty Co.
235—Geizler Bros. Stor. Battery Co.
236—Standard Leather Washer Mfg. Co.
237—William P. Miller's Sons
238—McGraw Tire and Rubber Co.
239—H. W. Johns-Manville Co.

BALCONY EXTENSION, MADISON AVENUE

240—Emil Grossman Co.
241—McCue Co.
242—Stein Double Cushion Tire Co.
243—Tray Plate Battery Co.
244—Elite Mfg. Co.
245—Riley-Klotz Mfg. Co.
246—Hopewell Bros.
247—Motor Car Equipment Co.
248—Novelty Mfg. Co.
249—Automatic Headlight Co.
251—Burn-Boston Battery & Mfg. Co.
252—Frank H. Cross
253—N. J. Car Spring & Rubber Co.

BALCONY EXTENSION, FOURTH AVENUE

255—Bosch Magneto Co.
257—Stackpole Battery Co.
258—Metal Stamping Co.
259—Vanadium Metals Co.
260—Zeglen Bullet Proof Cloth Co.
261—Howard Demountable Rim Co.
263—Cox Brass Mfg. Co.
263A—Philip C. Traver Mfg. Co.
264—Lavigne Mfg. Co.
265—Barnard Specialty Co.
266—Stevens & Co.
267—Livingston Radiator and Mfg. Co.
268—P. Reilly & Son.
269—Perfection Spring Co.
270—Detroit Motor Car Supply Co.
271—Wayne Oil Tank and Pump Co.

CONCERT HALL

300—Sprague Umbrella Co.
301—L. C. Chase Co.
302—Victor Auto Supply Mfg. Co.
303—Columbia Lubricants Co. of N. Y.
304—A. O. Smith Co.
305—Thermoid Rubber Co.
306—Standard Roller Bearing Co.
307—Stromberg Motor Devices Co.
308—U. S. Light and Heating Co.
309—Pantasote Co.
310—Federal Rubber Co.
311—Hayes Mfg. Co.
312—Vesta Accumulator Co.
313—National Coil Co.
314—Dayton Rubber Mfg. Co.
315—Hancock Mfg. Co.
316—Seamless Rubber Co.
317—C. M. Hall Lamp Co.
318—Royal Equipment Co.
319—McCord Mfg. Co.
320—Lebanon Steel Casting Co.
321—Briggs & Stratton.
322—Lovell-McConnell Mfg. Co.
323—Rands Mfg. Co.
324—Excelsior Motor & Mfg. Co.
325—Gemmer Mfg. Co.
326—Hess-Bright Mfg. Co.

SECOND TIER

400—Newark Rivet Works
401—Wright Wrench Mfg. Co.
402—C. A. Willey Co.
403—Kamlee Company
404—Hilton Mfg. Co.
405—Dover Stamping and Mfg. Co.
406—Grimm-Plaut Construction Co.
407—Calmon Asbestos and Rubber Works
408—Shipman Instrument Co.
409—Woven Steel Hose and Rubber Co.
410—Union Battery Co.
411—Waterhouse Co.
412—Motor Parts Co.
413—Harry A. Allers Co.
414—Columbia Nut and Bolt Co.
415—Recometre Co. of America

ROOM 7

416—Rothstein Mfg. Co.
417—B. M. Asch
418—William R. Winn
419—New York Coil Co.
420—Vorhees Rubber Mfg. Co.
421—Gasoline Motor Efficiency Co.
422—Favary Tire & Cushion Co.
423—Chandler Co.
424—Rushmore Dynamo Works
425—English & Mersick Co.
426—E. M. Benford

BASEMENT, ACCESSORIES

500—Merchant & Evans
501—James L. Gibney & Bro.
502—W. E. Pruden Hardware Co.
503—Como Electric Co.
504—H. & F. Mesinger Mfg. Co.
505—Motor Age
506—Automobile
507—Horseless Age
508—Valvoline Oil Co.
509—Nathan Novelty Mfg. Co.
510—A-Z Co.
511—Julius Kink Optical Co.
512—Motor
513—International Engineering Co.
514—Motor Print
515—Motor Vehicle Pub. Co.
516—Joseph Tracy
517—Burroughs Demountable Rim Co.
518—Apple Electric Co.
519—Chilton Printing Co.
520—Nonpareil Horn Mfg. Co.
521—Erie Foundry Co.
522—Livingston Radiator Co.
523—Automobile Topics
524—New Departure Mfg. Co.
525—White & Bagley Co.
526—Vanguard Mfg. Co.
527—Ajax Trunk & Sample Case Co.
528—Kilgore Mfg. Co.
529—The Post & Lester Co.
530—Nightingale Whistle Mfg. Co.
531—A. S. Noonan Tool & Mach. Works
532—Willard Storage Battery Co.
533—Philadelphia Storage Battery Co.
534—National Auto Top Co.
535—Troy Carriage Sun Shade Co.

BASEMENT MOTOR CYCLE DEPARTMENT

600—Merkel Light Motor Co.
601—Bicycling World
602—Consolidated Mfg. Co.
603—N. S. U. Motor Co.
604—Motorcycle Publishing Co.
605—American Motor Co.
606—Hendee Mfg. Co.
607—Herring-Curtiss Co.
608—Harley-Davidson Motor Co.
609—Reading-Standard Co.
610—Aurora Automatic Machinery Co.
611—Greyhound Motor Works
612—Pierce Cycle Co.
613—Excelsior Supply Co.
614—New Era Gas Engine Co.
615—Eclipse Machine Co.
616—F. A. Baker & Co.
617—Royal Motor Works, Inc.
618—Miami Cycle & Mfg. Co.
618—Emblem Mfg. Co.
620—Marvel Motorcycle Co.
621—Reliance Motorcycle Co.
622—S. D. Mfg. Co.